WHITE PAPER



FIELD SERVICE OPTIMIZATION IN 2021



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Introduction

Field Services are repairs performed by service engineers at customer site. The primary objective of any field service provider is to provide customers with quick, efficient, and effective repairs for their devices, but the usual way of doing business took an unexpected turn in 2020 due to COVID-19. The global pandemic has caused a massive disruption in the field service industry and every field service provider has likely reevaluated their business model in some way or the other. Some have embraced the idea of contactless or remote services, while others are investing heavily in predictive maintenance and intelligent diagnostics.

The past year has also witnessed a significant increase in demand for field services due to

several reasons. People have spent more time in their homes last year than any other in the past and are utilizing their devices more than normal. In addition, it has also been observed that device lifecycles have increased in the past few years. Per Avast PC Trends Report 2019¹, the average age of PC increased from 5.5 years in 2017 to 6 years in 2019. Smartphones are also following a similar trend, average lifespan (replacement cycle length) of smartphones in the United States increased from 2.9 years in 2018 to 3.2 years in 2020 as per Statistica.com Report². These referenced reports were published before the pandemic. Global supply chain constraints and reduction of personal expendable income has likely increased average device age even further. We believe that increasing device lifecycle is a salient trend. As device usage and lifecycle increases, demand for aftermarket parts and field services will also increase significantly. This has broad implications for both OEMs and field service providers. Instead of just focusing on selling to the first or the second owner, companies will need to sell to the third or the fourth owner. Companies will need to track secondary sales, foster end-customer relationships by connecting with them directly, improve aftermarket parts supply chain and transform how they deliver field services.

As we continue to navigate COVID-19 and look towards the future, this article examines some of the key challenges in field services and provide insights into how companies can improve their customer's experience and service levels while keeping servicing costs and spares inventory low.

Challenges in Field Service Operations

Field service operations require close coordination across the value chain that includes contact center, service supply chain, service center, field engineers and customers. Traditionally, field service has operated as a cost center with limited opportunities to generate revenues.

However, companies are now trying to understand the challenges across the field service value chain to improve the customer experience optimize the workforce and gain process efficiencies.

To understand the major challenges faced by field service personnel, we recommend developing a process decomposition of the field service value chain and then taking a persona-based approach to identify issues across the entire value chain. The whole lifecycle of a service request consists of a customer raising a request, contact center agent taking the request, troubleshooting and assigning to a field technician, field technician visiting a customer site and resolving the issue. The entire process requires coordination across functions that make up the value chain and each function faces a unique set of challenges.



We recently completed an assessment of field service operations for a consumer devices manufacturer in the Technology industry. Here is a summary of challenges faced by various personas identified across the field service value chain.



Contact Center Agent

First touchpaint for the customers when they call helpdesk, troubleshoots and resolves customer issues remotely or arranges for a technician visit

Accurate customer information

- · SLAs, contracts agreements are not maintained in a common repository and are not retrievable easily
- SLAs/ Contracts are not linked to indiidual cases

Troubleshooting databases

- Incorrect diagnosis leads to multiple visits and in turn, increases cost of service
- · Lack of a smart analytics solutions to help agent possible with troubleshooting tips
- · Lack of timely training on new product launches
- · Technical information is spread across multiple tools, non-standard formats(web/email/share point)

Part and field Engineer status

• System does not provide any ETA on part availability or FE's Visit status

Work culure

· High attribion on the floor, results in low knowledge retention and continuity



Field Service Excutive

Backbone of the field services, plans every day based on pending cases, trying to maximize the throughput per day

Contact and scheduling

- Case scheduling is mostly manual and leads to inefficient mapping of engineers to unknown/new location, thereby field
 engineer ends up wasting time in searching for customer location. Time of the day traffic parking issues in city center are not
 considered
- Although address is accurate, Google Maps gave incorrect directions (new construction) customer was not reachable on phone
 or sms

Knowledge, Communication and training gaps

- · Communication gaps between field engineer and the contact center
- · Lack of timely training on new product launches
- Inability to Validate new order/ correct part or reschedule visit on the mobile app

Parts accuracy and availability

- · Incorrect part diagnosis
- Lack of real time part availability status, delay in logistics
- · Parts quality (scratches on HDD), DOA (Dead on Arrival), inaccurate CT (Component Tracking) #, PFE downgrades



Supply Chain Manager

Manages parts availability to service centers, parts returns, forecasts and plans part availability to meet the demand

Planning & forecasting

- · Accurate Planning process is a continuous issue and an area for impeovement
- Rebalancing of excess/short inventory between warehouses is manual

Faulty parts and status

issues with quality checks before part dispatch to Depot (~2% DOA parts are dispatched currently)

Parts Delivery & Status

- · Lack of automation to provide real-time ETA on part availability to CC Agent, Depot and Field Engineer
- Inconsistent delays in parts delivery by courier partners. creates delay



Bench/Depot Technician

"Face of company's Services for the customer, interacts in-person with the customers and addresses their issues

Facilty parts and status

- Part might be DOA and there are delays in parts delivery
- ETA on part availability is not accurate and hence customer is provided with a generic timeline of 3-7 days, depending on the type of part and historical part procurement experience

Process / tool limitations

- Manual process to deal with DOA cases, long ETA due to the manual approval process
- Real time case tracking not available for customers, hence it happens mostly through calls between bench engineers and customers

Knowledge and training

Knowledge sharing and training on new products is not timely



Customer

Recipient of serices and focal point of the service operatios - all processes have touchpoints with the Customer personal

Wait times and reschedules

• Customer waiting time on contact center calls is high. This is a particularly problematic area in printers, as the diagnostic takes time and users aren't well versed with the products technical details

Entitlement and contact information

- Customer is unaware of the warranty policies, takes time to find device serial# or proof of purchase
- EVR does not recognize customer on subsequent visits

Part accuracy

· Replacement part does not work as it was expected resulting in reschedules/ revisits

Accurate status/ communication

• Real time case status tracking mechanism for thecustomer is missing

Non-intuitive troubleshooting

 sapport site does not provide easy navigation for troubleshooting and self-repair for simple issues such as software fixes, driver installation

Proposed Solutions- Field Service Optimization

Based on the identified challenges faced by the field service organizations, we have captured potential improvement opportunities and organized them into five major solution themes of Field Service Mobility, Automated Field Service Scheduling, Cohesive Customer Experience, Performance Management & Optimization and Intelligent Diagnostics & Troubleshooting. Here is a summary.

1. Solutions for Intelligent Diagnostics and Troubleshooting

1. Improve diagnostic applications

Improving the coverage of diagnostic UEFI utility by extending UEFI to support all critical component configurations could significantly improve diagnostics and troubleshooting processes. Simplifying the diagnostic UEFI interface for end users- a wizard-like interface to guide the user through the next steps could also improve usability of the tool and enable end-users to perform self-diagnostics. Enabling self-diagnostic capability will result in reducing the overall field service cost and optimizing case handling, especially post the pandemic.

2. Improve telemetry analysis

Enabling analysis of current state of telemetry data capture and analytics, comparing against leading practices from other industries could also improve diagnostic capability. Utilizing historical cases, solutions, and knowledge databases to identify issue patterns for specific configurations could help in performing different dimensions of diagnostics such as:

- Preventive: Map issue and configuration patterns to the installed base. Check telemetry for anomalous behavior and reach out to customer for preventive fixes
- Predictive: Using installed base, predict potential failures and use it to pre-position parts inventory and train contact center and field service engineers for upcoming troubleshooting and repair requests

 Automatically create dispatch order if it is a repeat issue or a high priority customer

3. Create end user troubleshooting simulations

Creating a simulated environment for guided troubleshooting through an application that looks like an end-user screen is a very pragmatic solution being adopted by leading device manufacturers across the globe. The contact center or CE assist team can use the simulation pages to better guide customers through troubleshooting such that:

- The simulation replaces remote desktop assists, helping lower the bandwidth usage
- The simulation application also captures troubleshooting notes and resolution
- Capability to create documentation on the fly from the simulation

4. Update installed base with PFE replacements

- Update installed base (as serviced BOM) for PFEs. Review this information for each case for that device
- Once a part is PFE-certified, save it in SAP/ERP database so that the certification process need not be repeated in subsequent occurrences

5. Mine case data to improve troubleshooting

Utilizing the historical case, solution, and knowledge databases to identify issue patterns for specific configurations can significantly improve future troubleshooting and diagnostic standards. These patterns could aid troubleshooting and could be linked with solution recommendations (for instance, top three based on probability of occurrence) to improve troubleshooting effectiveness. Recommendations could include parts to be replaced and specific how-to-solve/diagnose steps and flowcharts. This work could be done independent of telemetry.

6. Deploy wearables selectively

 Using smart glasses could virtually assist field engineers in real time, working in

- the field. They could seek remote help through L1.5 / L2 by using wearables like smart glasses
- Using smart watches could capture error codes and confirm without calling contact/service center. A smart watch can complete it without the technician taking hands off from the product
- Smart watches could also be used to easily interact with the field engineers in the field. With a phone, the engineer has to check it continually for updates as well as schedules. While with a smart watch, these can be delivered to him without having to stop the vehicle

7. Troubleshoot using affordable Google Cardboard-like AR glasses

Enabling customers to use Cardboard or mini AR glasses that work with customer app for guided troubleshooting could be a game changes across the field service industry. These low-priced \$10 retail glasses could be potentially sent with every unit. Coupled with the app, they could be used to provide a more immersive and controlled experience that can help non-technical customers troubleshoot easily. Field engineers as well could use these devices for complex repairs.

8. Test jig at service center

Instead of expert bench engineers, deploying a device test jig at service centers could result in a quicker troubleshooting of cases. Customers, with some help from a non-expert technician could plug in their device into the test jig that can run comprehensive troubleshooting software. Remote CE assist can monitor troubleshooting and based on the result, dispatch the required part, thereby reducing bandwidth issues.

Impact

Industry insights

Reduction in call volumes by 15%, resulting from high usage of self-diagnostic tools for a leading communication service provider in the US.

2. Solutions for Field Service Mobile application

1. Deploy a global Field Service Mobile (FSM) Application

Companies could look for opportunities to enhance their existing Field Service Mobile application and standardize the usage for field engineers globally. The application must ensure improved productivity for field engineers, ensure that a standard process is followed across the field and enable a consistent experience for customers. The app could be integrated with case database, supply chain ERP systems, CRM, and knowledge management systems to provide comprehensive information to the field engineer.

Key capabilities

- Personalization choice of language, time zones, maps, name and address schemes
- View today's schedule, parts availability status
- Schedule next visit or reschedule current visits
- Send the field engineer's current location to the dispatch center and contact center (geo tagging)
- On-field access to current case information, history of the cases linked with the device
- Capture case notes that are updated in real time in the main case
- Record an audio of case notes including diagnosis, parts replaced, device details, directions and parking information which can be transcribed and stored as case notes
- Allow field engineer to text contact center and service center from within the app
- Allow ordering of parts
- Allow creation of new work orders (for example, if a customer asks the field engineer to solve an issue on another device, after the field engineer is onsite)

- Field engineer can provide feedback when a buy box is broken and contact center can then arrange for it to be fixed
- Enable offline access to ensure in-time case resolution even at sites with bad internet connectivity

2. Enable troubleshooting functionality with the mobile app:

Enabling field engineers with direct access to the troubleshooting resources from within the Field Service Mobile app could be a potential game changer in enhancing productivity and diagnostics. This will prove even more pragmatic in the current pandemic situation to avoid multiple visits and increase first time fix rates:

- Common failures for the device (mined from other cases)
- WISE, KB tool access, component tracking (CT) lookup
- Enhanced capabilities to access the knowledge base such as knowledge map (Ontology or Machine Learning based) for easier and specific access

3. Enable collaboration via real-time smart chat (RTSC), audio and video conferencing on mobile app:

- An app-based real-time smart chat (RTSC) could allow collaboration with L2/ L3 SMEs and/or a chatbot to resolve a field engineer's query in the field. It will help field engineers to avoid making a call to the contact center and wait for L2/ L3 availability
- Additionally, enabling audio and video conferencing capability could allow field engineers to interact in real time with the L2/L3/tech support team to troubleshoot quickly at the customer site without having to wait or revisit
- Ability to share images and videos between L2/L3 SMEs and Field Engineers could help in quicker diagnosis
- AR device integration could provide for error-free input and resolution

Impact

Primary metrics influenced - Field

Engineer productivity (average number of cases resolved per day), number of repeat visits, first time fix

Industry insights

- Aberdeen reports that best-in-class field service organizations are 52% more likely to have invested in mobile tools that can provide tech personnel better access to information in the field
- Improved field technician productivity by 20% for a leading satellite TV provider through enhanced mobile capabilities. 17,000 field engineers across the US can use the mobile application
- Field Service Mobility application for a large US cable MSO improved technician effectiveness resulting in operational savings of US\$ 1.3 million a year. It also resulted in reduction in manual intervention and improved productivity by 10%

3. Solutions for Automated Field Service Scheduling

1. Automated Field Service Scheduling Engine

A scheduling engine could automate task assignments for field engineers. The assignments should be made based on configurable business rules. The business rules may take into consideration the field engineer's location (zip code), availability, projected utilization for the day, skillset, training record, time of day traffic, parking and customer's preferred time.

Scheduling engine's key capabilities:

- Perform advanced scheduling using multiple configurable parameters mentioned above for optimized dispatch operations
- Provide route optimization using nearest neighbor or similar algorithm
- Maximize scheduling window (the current window limits work orders that come in prior to 3 p.m. only)
- Integration with GPS to show the current location of the field engineer

- Single view of the information required by the field engineer for his field visit

 parts availability status, customer address, case summary, customer availability
- Accommodate changes to schedule
- · Provide capacity planning ability
- Generate daily operational metrics for analysis
- Provide the ability to configure and send notifications (or integrate with notification server) to customers

2. Capture customer site parking information

The contact center CRM systems could be configured to capture additional notes for the field engineer, such as parking information near the customer site within case notes, which the field engineer can use during his next visit. Delays due to lack of parking information is a major concern in lot of metro cities which eats up into a field engineer productivity.

Impact

Primary metrics influenced – field engineer productivity (average number of cases resolved per day)

Industry insights

 A leading broadband and phone service provider in the UK has a field force of 30,000. The company implemented a schedule and dispatch management solution which delivered several benefits: 60% reduction in back-office dispatch coordination, 35% field productivity improvement, reduction in customer appointment lead times, US\$ 220 million annual reduction in field operations costs.

4. Solutions for Cohesive Customer Experience

1. Optimize contact center capacity

Enable capabilities to analyze call center data (seasonality, new product launches) to predict patterns for incoming calls and identify additional capacity requirements. It will enable the contact center team to manage capacity in advance.

2. Redirect contact center demand for optimal experience

Adopt intelligent IVR systems for:

- Detecting when the wait time is going to be longer than the threshold and suggest alternative options such as callback, Web chat, self-care, e-mail / text.
- Phone number recognition for faster recognition and intelligent routing.
- Voice-to-text translation for recording issues and audio, creating a case, and scheduling a call-back.

3. Build customer's support profile

Encouraging customers to register online once they have bought products will help in creating customer's support profile that can be tagged to the e-mail addresses. Support profile could help in tracking the activity of the customer for support operations. This could eliminate the effort on capturing customer details on the call and reduce errors in capturing customer data. Over time, a customer's support profile can be built, including preferred communication method (e-mail, chat) and technical savviness. Some examples include:

- When the screen is launched for the first time, provide a pop-up to prompt the user for registration and provide contact information (including e-mail and / or phone)
- Provide incentives (free mouse / pad, extend warranty by three months) for registering
- Prevent access to support site without login
- Capture contact information including e-mail and phone during first contact (contact center, service center, chat)

4. Improve entitlement process reliability

Reviewing the entitlement/contract management process and the system is key to identify gaps and plan for action items. Ideally, contact centers must not require the customer to produce a proof of purchase (POP). It is also a good practice to understand the issues in detail, perform root case analysis, and formulate solution(s).

5. Implement case visual tracker

Implementing a visual tracker for the customer support site linked with case milestones and tracking real-time status could significantly improve customer experience.

6. Enable guided troubleshooting

Enabling a guided troubleshooting on company site and converting the existing troubleshooting tree to guided page sequences and using the results of the troubleshooting to enable click-to-call, click-to-chat while preserving state and data could significantly reduce and route the incoming support traffic to intended channel. Usability and scalability of the support site (how quickly and easily a user can access the desired content) should be an important consideration. Customer chatbots could eventually take over the guided troubleshooting functionality. Integrating click-to-chat and click-tocall could enable data and state transfer between chatbot and a call center agent as per the case complexity and requirement.

7. Enable omni-channel customer support experience

Facilitating an omni-channel device experience for the customer by enabling interaction transfer across channels (chatbot to chat, website to chat, case management to chat, chat to call, customer app to chat / call) is imperative without making the customer repeat credentialing or device fault information. It could provide several benefits like improved customer satisfaction (sNPS), reduced wait time, optimized support demand shaping that can reduce contact center capacity. This solution requires integration of chatbot, website, contact center IVR and customer support to enable interaction of case states across systems.

8. Create customer experience paths across interactions

Analyzing case history to identify issues for self-service and then creating experience paths on the website and / or contact center is critical in shaping customer support demand through near friction-free experiences.

Impact

Primary metrics influenced – sNPS, field engineer productivity (average number of cases resolved per day).

Industry insights

'Cost savings are the best-known benefit, but less-well-known benefits include insights from unstructured data, cost optimization, and experience improvement for customers and agents.' – Forrester

5. Solutions for Performance Management and Optimization

1. Performance analytics:

Establishing a control tower with defined operational level agreements for the entire field service operations could provide for several critical capabilities including:

- Alerts and notifications on case ageing status, missed SLAs for contact center, depot services, field engineers and service supply chain teams
- Insights into key operational metrics to improve operational efficiency

2. Real-time field engineer visibility:

Enabling a real-time integration of service vendor CRM systems with company's system could provide significant benefits in geographies where field service is primarily outsourced to third party service vendors using a custom CRM system to manage and fix device cases, such as:

- Tracking field engineer assigned to cases
- · Tracking real-time case status
- Sending notifications to customer on field engineer status. Update status of parts and field engineer on company site

3. Reward high-performing field engineers:

Assessing performance, defining rewards, and creating recognition mechanism for high performing engineers could go a long way in enhancing employee productivity and satisfaction by tracking:

 Case feedback by customer (sNPS), average number of cases solved per week/month, average turnaround time per case, first-time fix (FTF) rate and training adherence.

4. Blockchain-enabled tracking and visibility:

Deploying blockchain capabilities across the field service value chain could enhance traceability and visibility to:

 Track and trace end-to-end journey of a case; this enables the customer to access all the information about the use case journey.

- Leverage digital profile and establish trust, commit transparency to partners / stakeholders across contact centers, SSC, depot, field engineer and customer.
- Improved inventory management and efficient SCM planning, near realtime visibility leading to efficient case scheduling.
- Ease of publishing case notes through immutable document, accurate case resolution commitments based on shared ledger.

Impact

Primary metrics influenced – overall operational efficiency

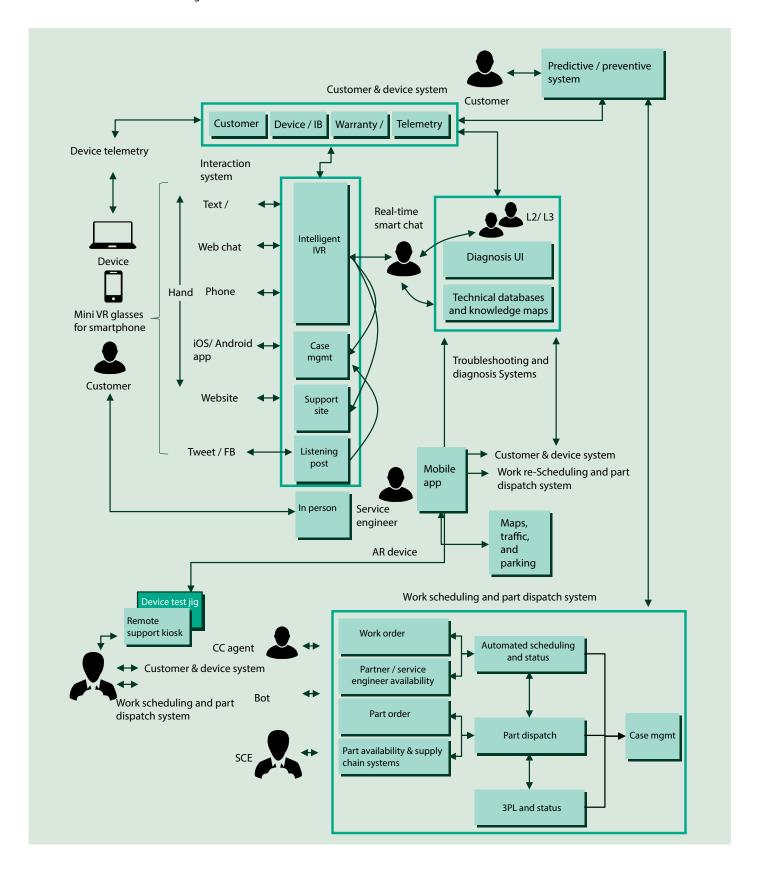
Industry insights

37% reduction in customer contacts, 33% reduction in repeat customer calls, 5% reduction in handling time, 6% improvement in contact center agent productivity



Future of Field Service Operations

We have also developed what a potential "Future of Field Services" could look like- a vision of required capabilities presented in a connected manner. We believe this connected view along with the proposed solutions will guide the business leaders to optimize and bring process efficiencies in their field service organization.



Conclusion

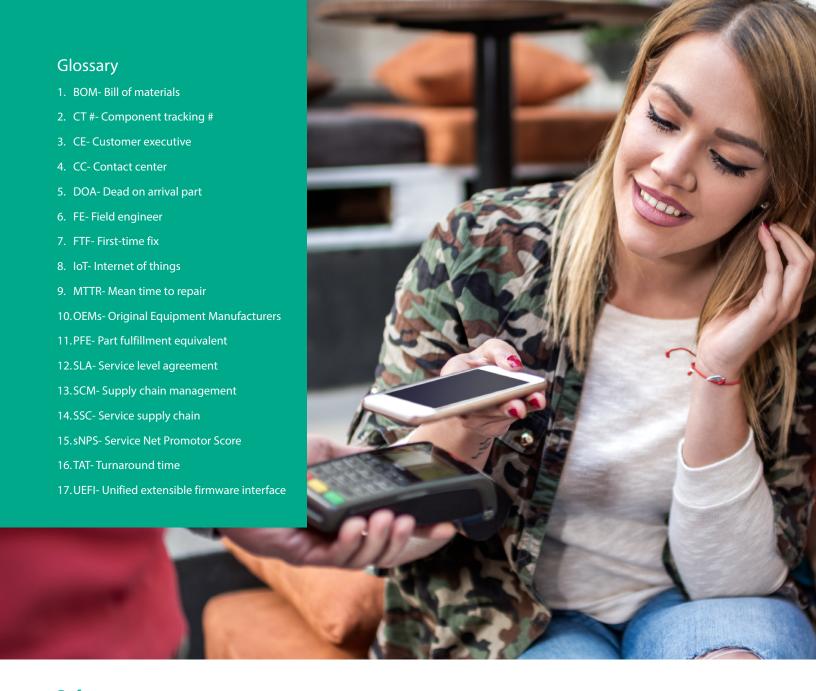
Field Service industry and device manufacturers face unprecedented competition within the industry and external players. Due to high digital disruption, organizations are providing multiple consumer touchpoints and every major player operating in field services is clocking more than 4-5 million service events/interventions every year, resulting in one of the largest number of consumer touchpoints. It is imperative for organizations to digitize and disrupt field service operations to stay closer and relevant to the customer.

It is also critical for the high-tech and device manufacturing industry to explore opportunities for improvement across the end-to-end processes in the field services value chain (contact center operations, service supply chain, depot operations, field engineer dispatch and customer servicing). These opportunities serve as foundation for a short, medium, and long-term analytics and technology road map to drive sustained improvements in customer experience and operating environment.

Advanced technology such as IoT (Internet of Things) that can provide always-on product telemetry, together with data analytics, enable predictive and preventive use cases and drive serviceability across industries. Wearables are expensive and companies are still in the experimental phase. However, technology promises to radically shape the industry by improving responsiveness, first-time fix, service quality and customer safety, especially during and after the Covid-19 pandemic. Moreover, advanced field service mobility solutions and improving maturity of augmented reality/mixed reality are providing new ways of working for field service engineers. It is dramatically shaping field service operations and the way field service engineers interact with customers and their devices.

In the future, technology will be deeply embedded in field service operations with the field engineer providing a human connection and becoming an ambassador of the company interacting with the customer.





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