

Digital User Experience Testing Services

Introduction to the DUET offering



“Digital life is life itself, and technology is an essential part of being human”

From Telefonica vision (www.telefonica.com)

Digital is no longer a choice – it's reality...





Welcome to **Generation C!**

Connection | **C**ommunity | **C**reation | **C**uration

Personal, intelligent
experiences

Enthusiastic
brand advocates

Seeking **control**
and **empowerment**



4

The effects of Digital on our industry

Customer **channel of choice**

Community-based engagements

Importance of **immediacy**

The effects of Digital on testing

Full coverage: certified on **all channels, systems, devices and browsers**

Ensuring the quality of a **User Centric**, Touch-&-Go Digital Experience

Accuracy and **quality with faster time to market, and continuous deployment - accelerates Dev Ops**

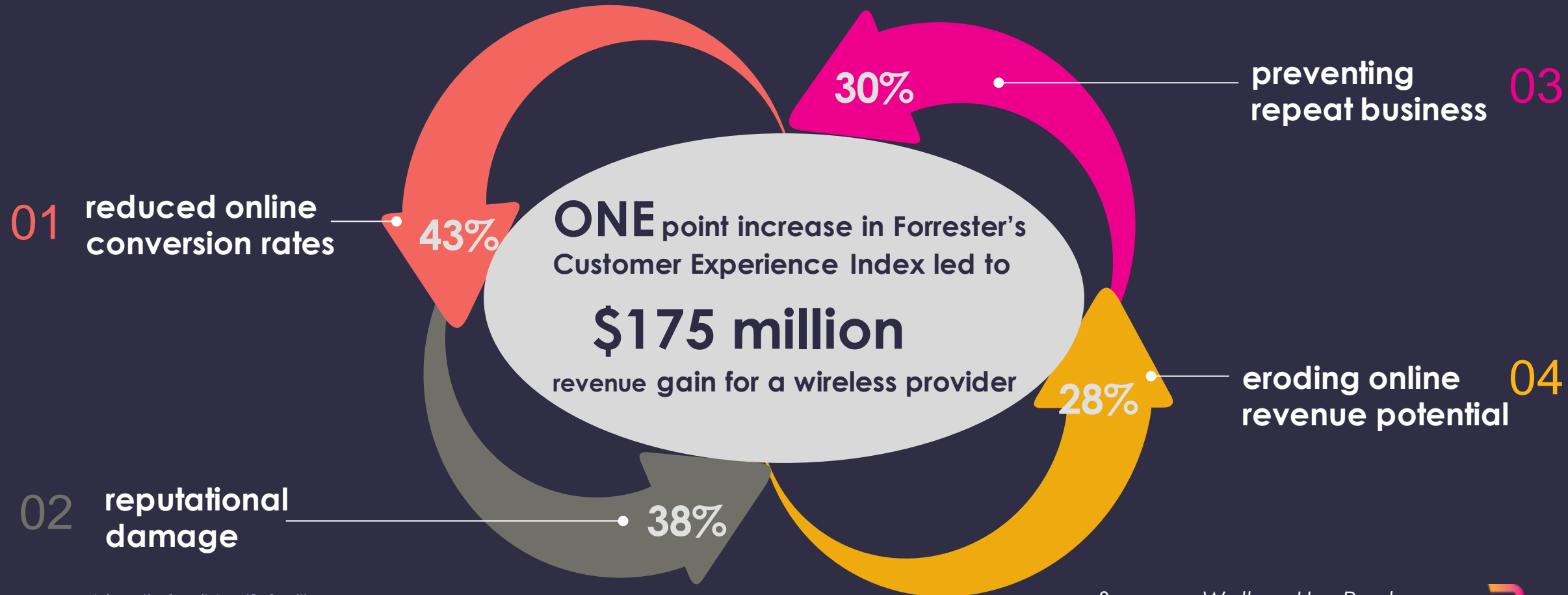
4



Superior user experiences is king

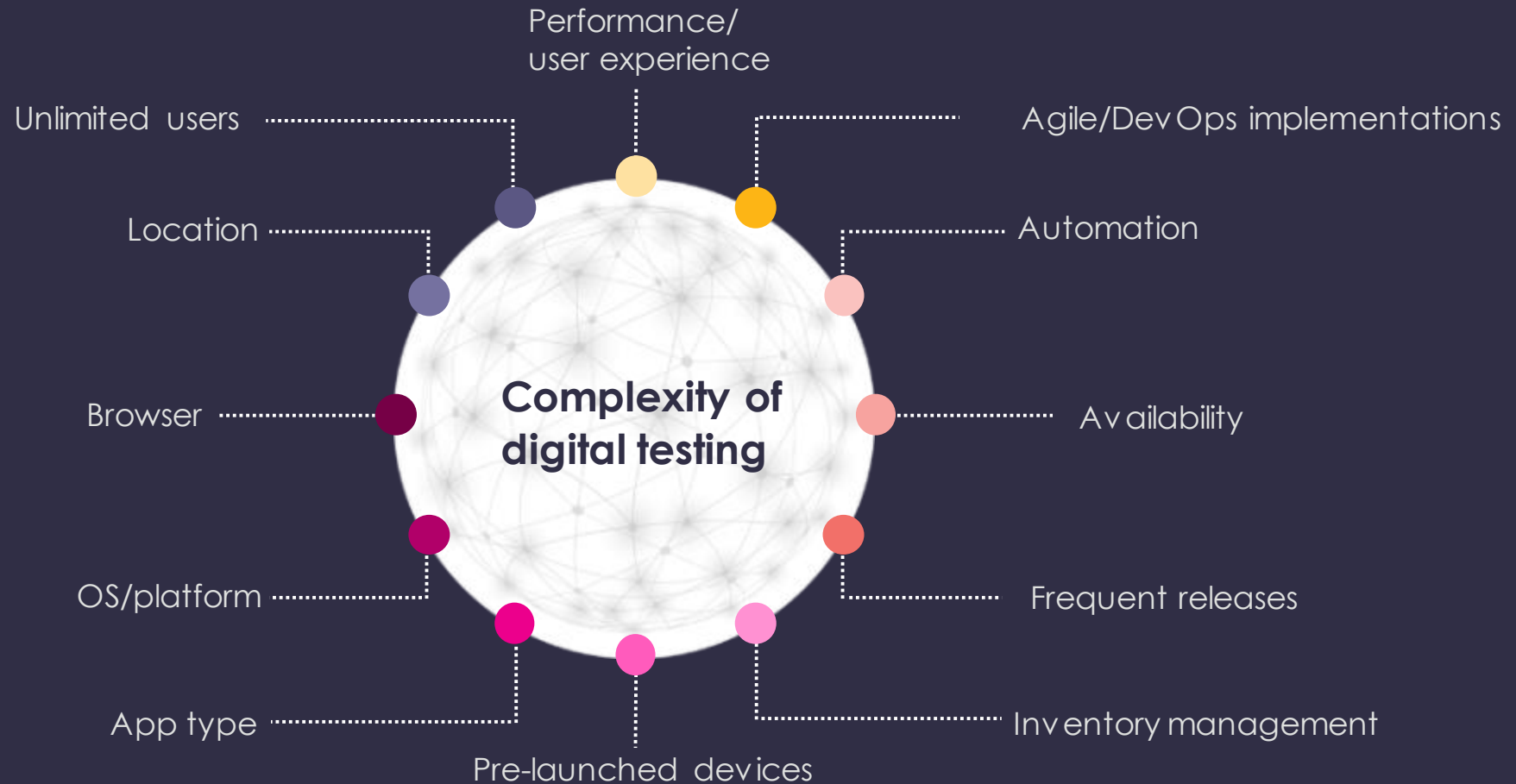
By 2020 customer experience will overtake price and product as key differentiator

Sub-optimal customer experience is seen to result in



Deliver a seamless user experience across all channels

addressing all complexities



while delivering **quicker value to business**

Digital User Experience testing is a Comprehensive testing framework

- Broad Set of testing services to enhance **customer experience** and drive revenue **covering all Digital complexities**
- Enables **omni-channel experience** across demographics, locations, devices and operating systems



Optimized coverage

.

Faster

.

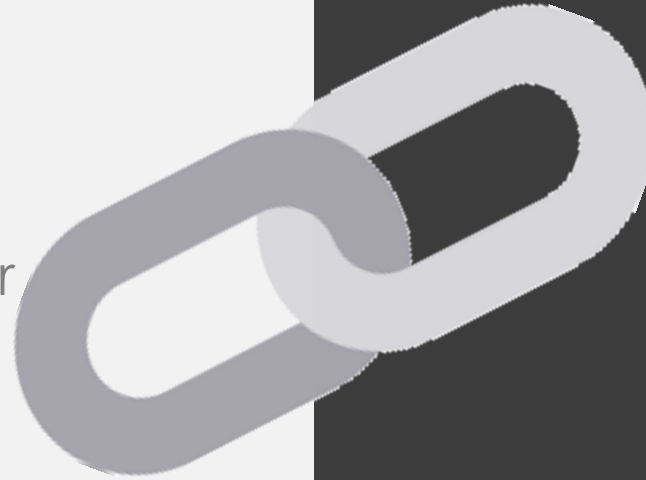
Enhanced quality

Amdocs DUET

Amdocs Digital User Experience Testing

front end

Mobile devices, browsers, user interface....



back end

Back-end systems (billing, provisioning, CRM...)

LEVERAGING AMDOCS' FRONT END & BACK END EXPERTISE, TOOLS AND COLLATERAL

ENRICHED VIA AMDOCS' PARTNERSHIP WITH LEADING DIGITAL TESTING VENDORS



Partnership



DevOps



Automation



Cloud



Analytics



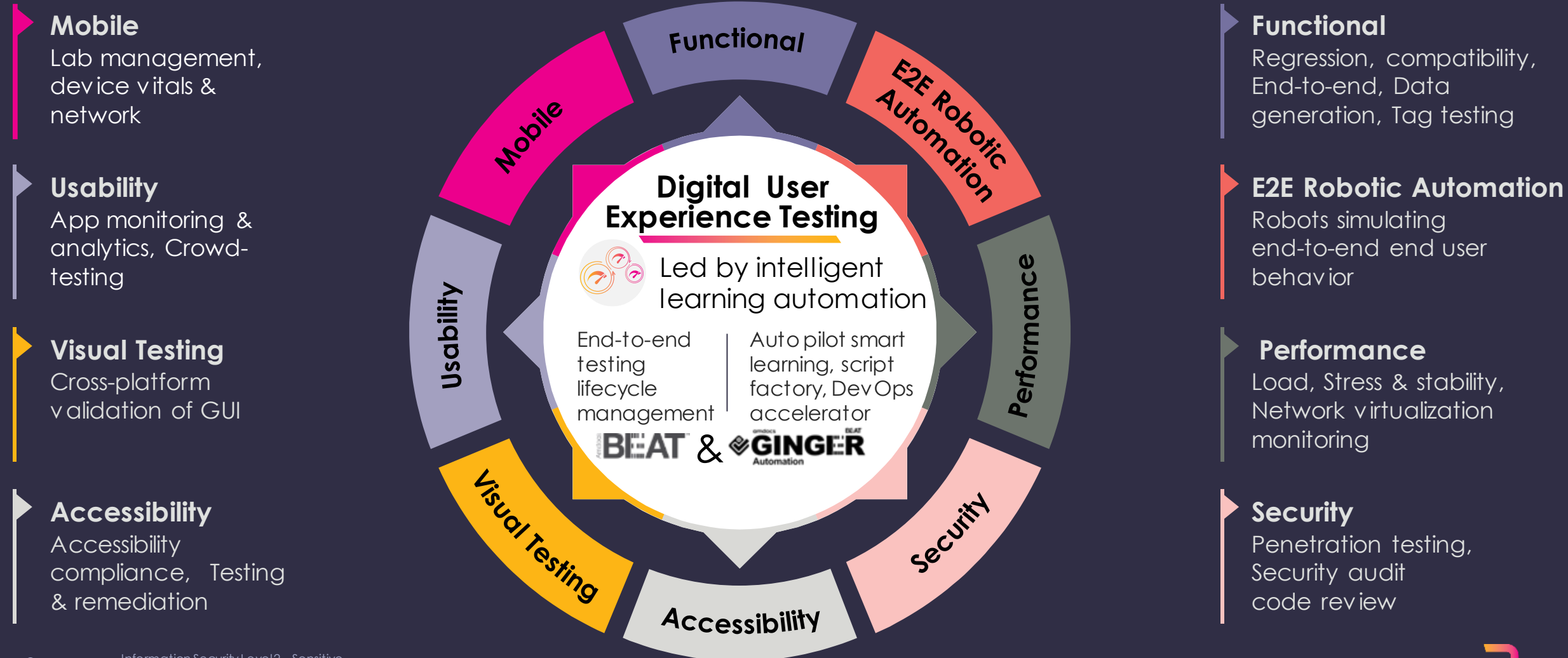
Open
Platforms



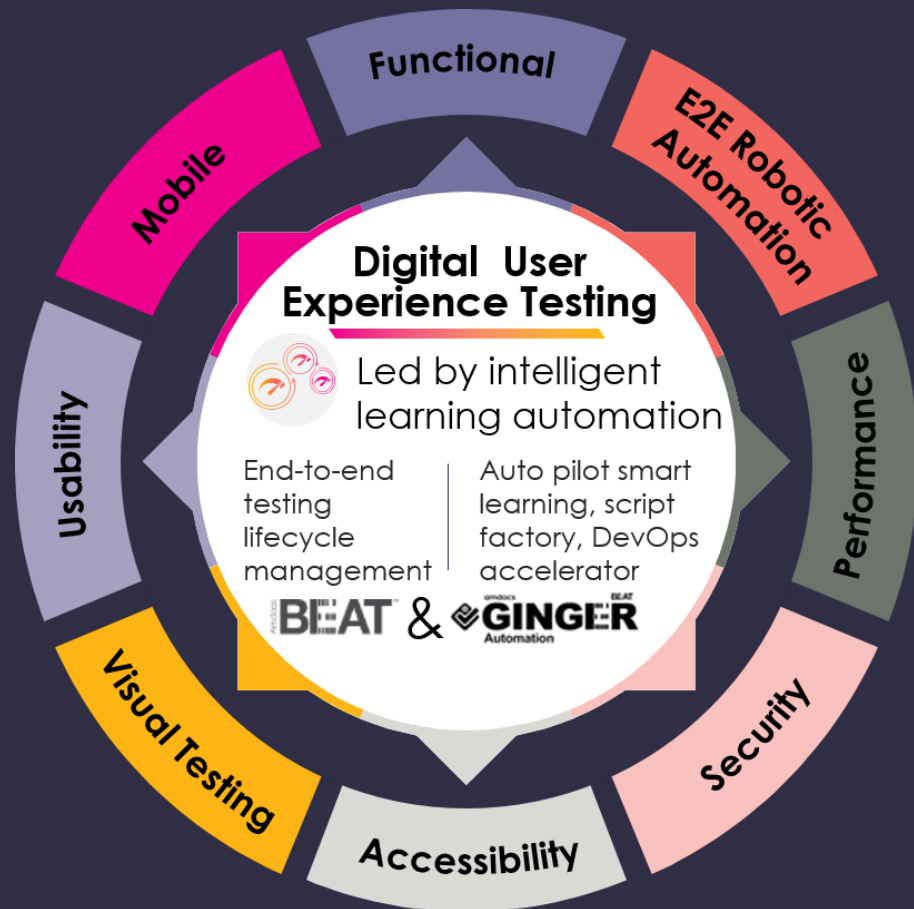
Virtualization

Amdocs **DUET** - Comprehensive offering to cover all digital aspects

Based on Amdocs Testing platform BEAT - automating the entire cycle
Enriched with a comprehensive set of advanced Digital services



Amdocs **DUET** - Comprehensive offering to cover all digital aspects



Is it working?

- Functional
- Integration
- Platform
- E2E
- Regression

Is it usable, secure, fast and reliable?

- Security
- Performance
- Usability
- Visual
- Compatibility
- Accessibility

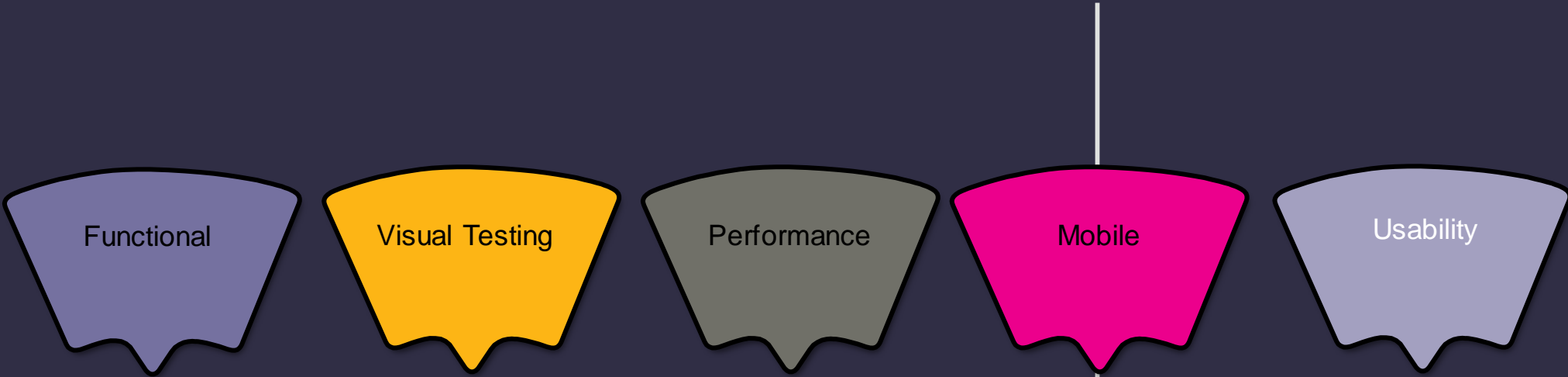
Are we able to delight the customer?

- Application monitoring & analytics
- In the wild exploratory testing

Is it delivered faster, better and efficiently?

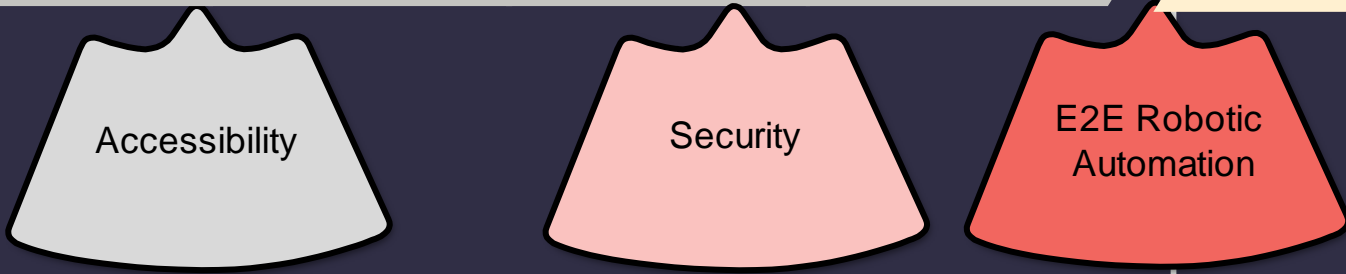
- Advanced automation
- Productivity improvements, reuse
- Early testing

Digital testing services landscape has expanded



From digital user experience quality assurance...

...to business assurance



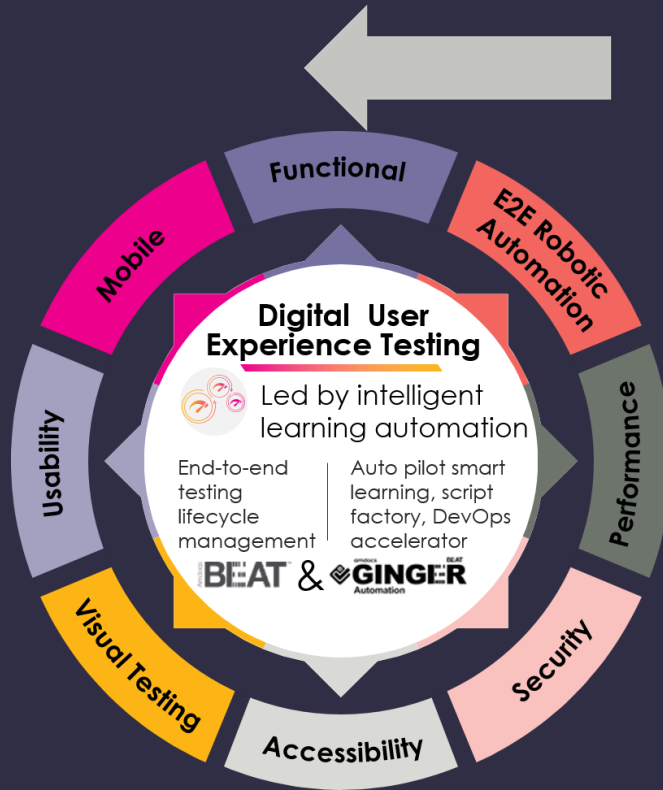
Pre-production

Post production



And continue to expand services landscape to shift left and shift right

DevOps in Action



From early stages of scoping and planning ...

... to monitoring and analytics

Pre-production

Post production

Business models

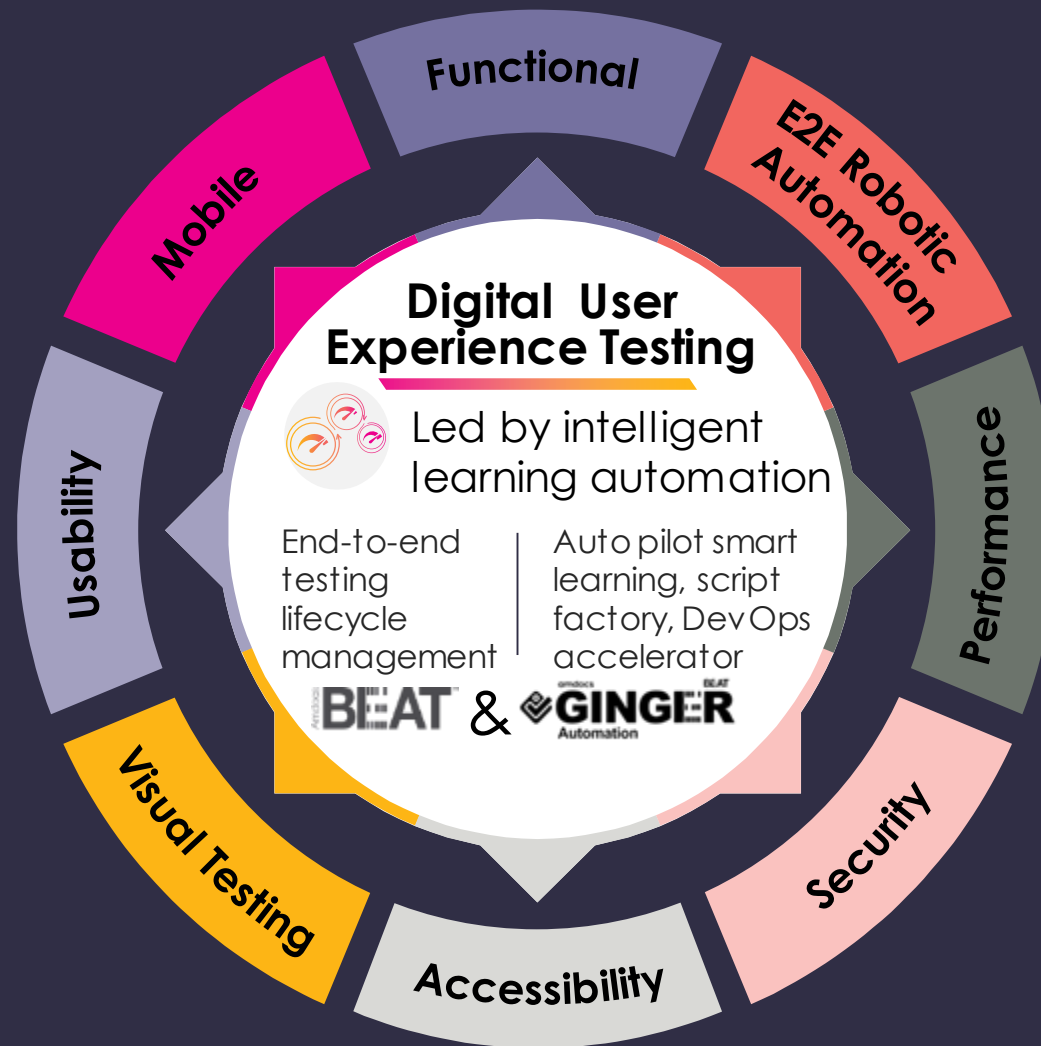
Entire suite offering

Pick and choose approach

A holistic comprehensive solution that covers all digital aspects ensuring optimal customer experience

Specific services are offered to address specific digital needs to enhance digital offering

Amdocs **DUET** - Amdocs platform and enablers



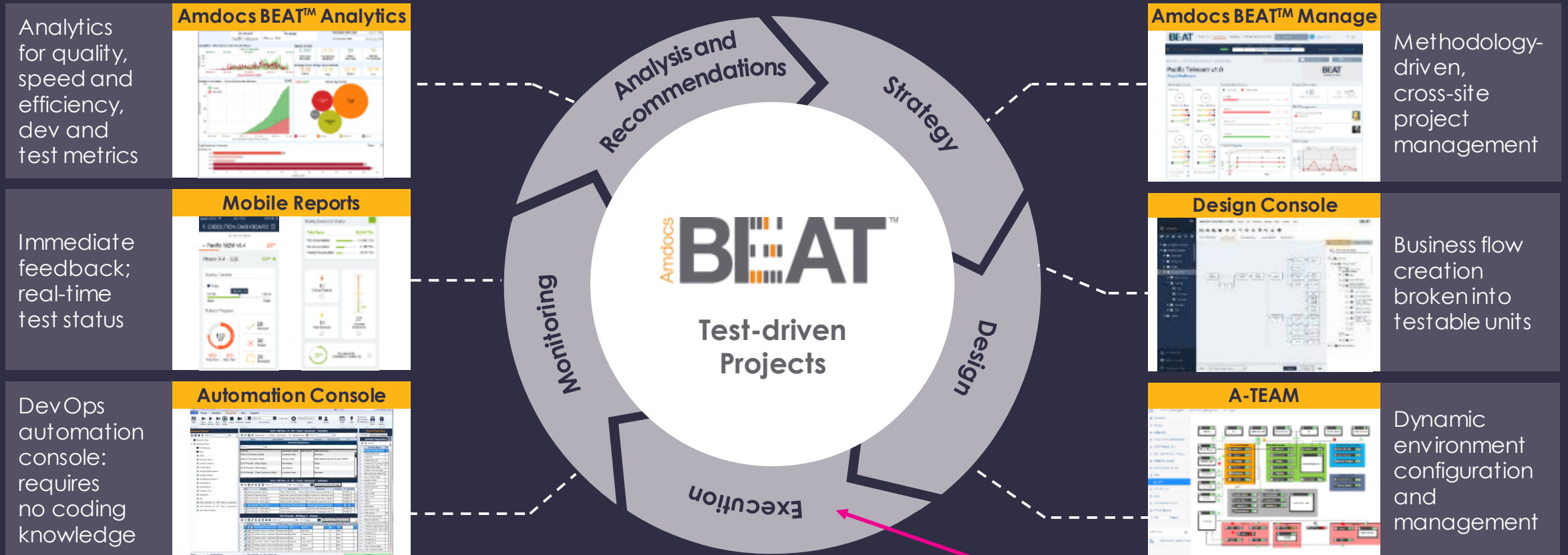
Led by **Amdocs automation** tools and enablers



Automating the entire life cycle

Amdocs BEAT™—automated E2E testing life cycle

From the early stages of panning and scoping up op the monitoring in productions



Amdocs offers DUET services based on BEAT platform enablers and tools. The partnership with 3rd party, best of breed solutions are operating in the **execution** phase



Amdocs BEAT™ - Ginger automation framework



Web Technologies

- Super easy record & playback
- Parallel Execution
- Cross Browser Support

Amdocs Apps

- Built-in proprietary access
- Direct connection enabling fast Automation
- Shared repository for world-wide deployment
- Automation from Delivery, ST, UAT to Production



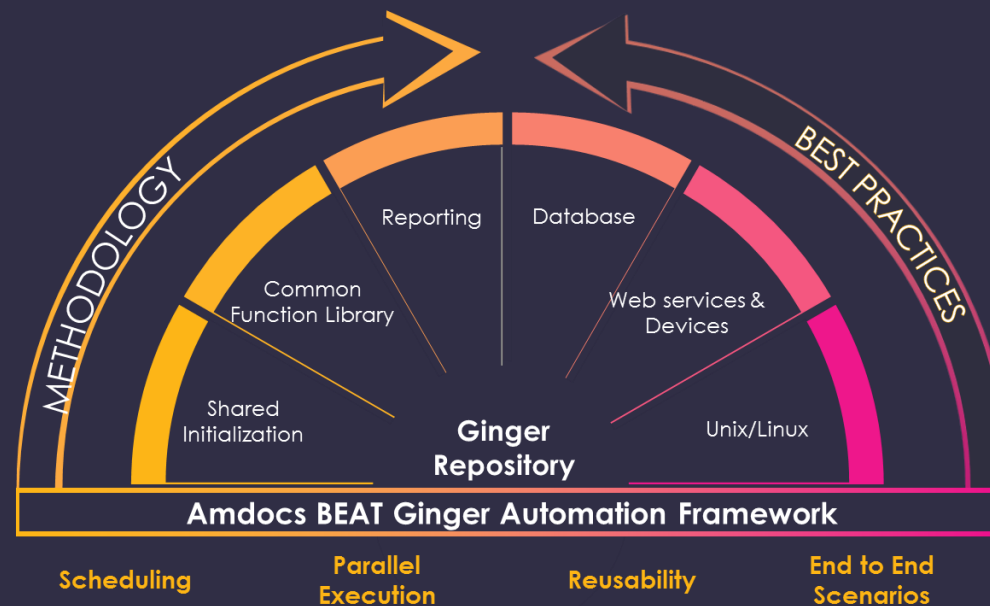
OS & Middleware Platforms

- Unix/Linux, DB, Tuxedo and Enabler/Billing Automation
- MEC Automation Solution
- BPT & Product Catalogue Combinations
- Integrated API/XML Automation framework



Mobile Devices

- Support major Device OS (Android, IOS & Windows)
- On-Premise & Remote/Cloud Device labs
- Visual confirmation of on-device activities/swipes

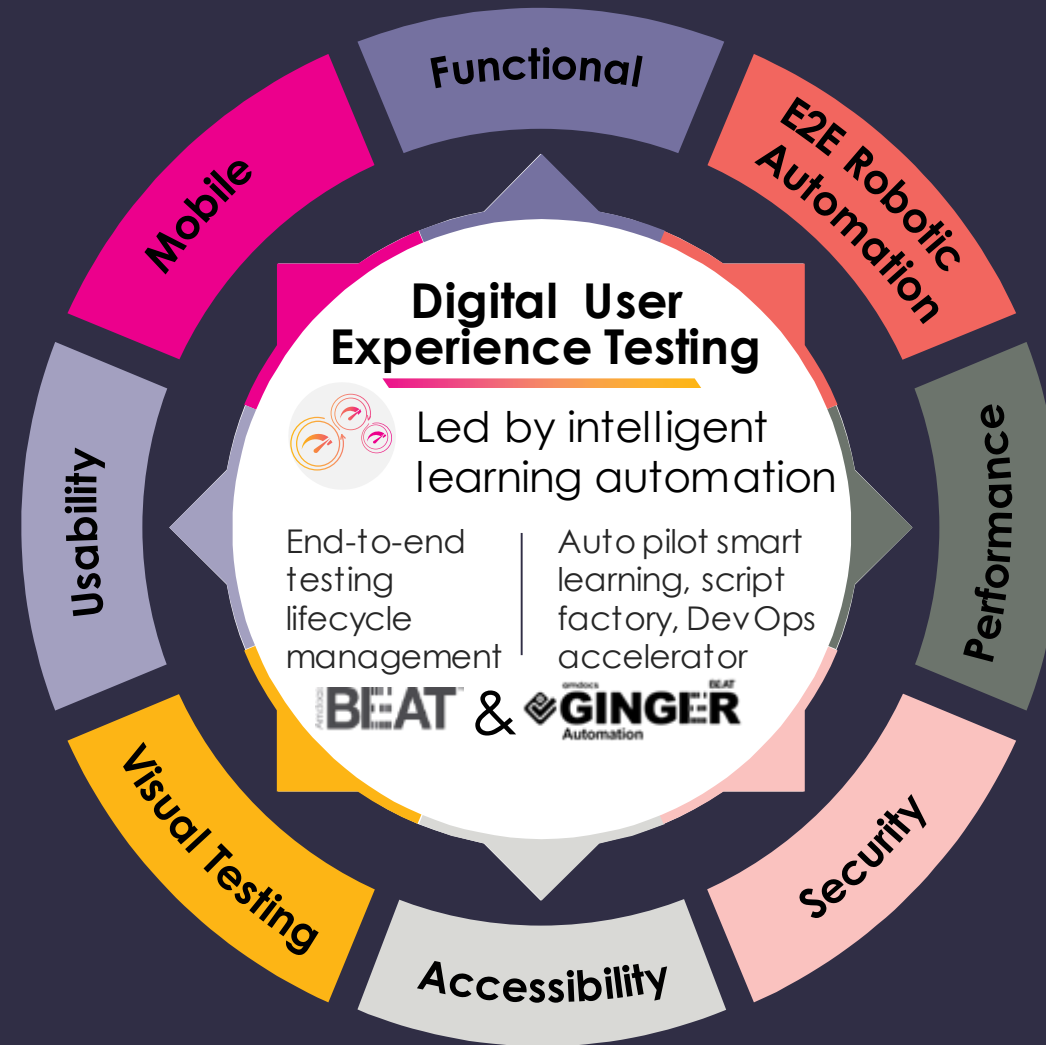


Drag & Drop

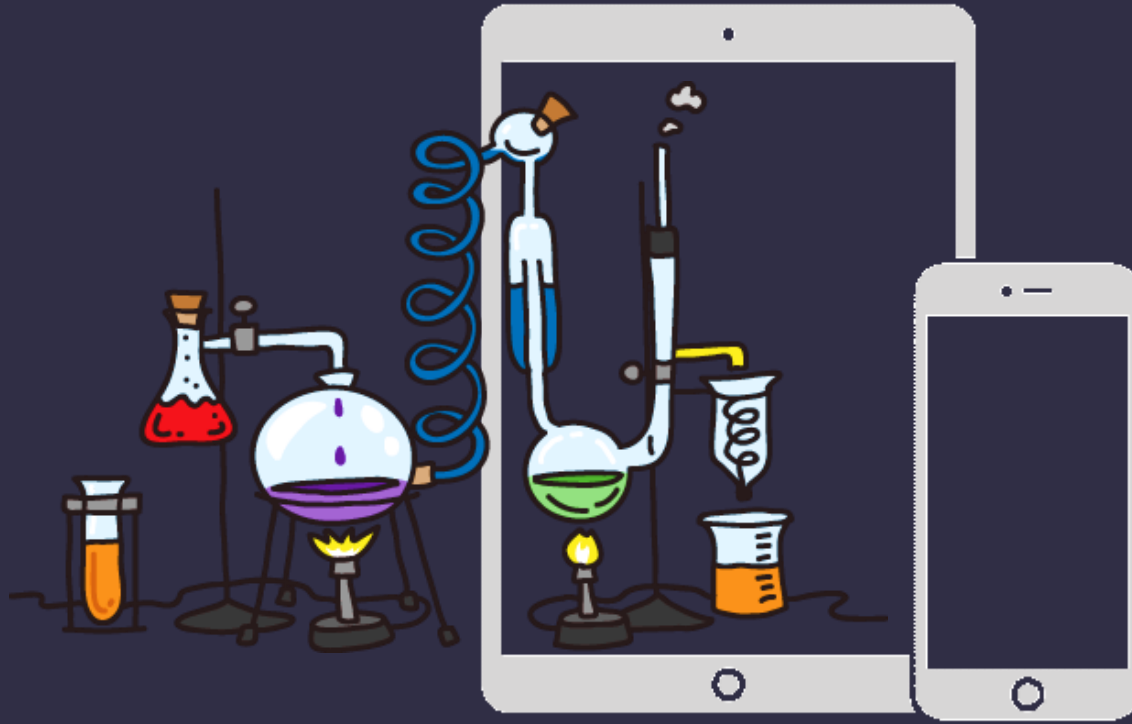
Cloud Enabled

Central Repo.

Detailed Reporting



Mobile testing motivation



52% of customers are less likely to engage with the company because of bad mobile experience

Challenges of testing applications on mobile devices

Poor quality

High escaping defects

Testing coverage with multiple device types, browser types, OS

Measure & track additional parameters

- Device vitals: battery, memory, CPU...
- Various network conditions (3G, Wifi...)
- Interrupts (incoming call, SMS...)

Costly and lengthy TTM

Delayed release

Managing device types, connections, software (versions of applications, OS and browsers), scripts

Managing device time allocation to testers

Integration with CI/CD/DevOps process



Newly released devices and OSs
Provisioning & backwards compatibility of scripts

Advanced mobile testing and lab management

Centralized & advanced mobile app testing from anywhere at any time on any device

Set-up and management of leading 3rd party mobile device lab

Device management including provisioning, OS and app management, device reservation system, plus:

Advanced testing:

Functional/compatibility/performance on native, web and hybrid apps

Tracking device vitals such as CPU, memory, battery

Testing varying network conditions (advanced network virtualization), interrupts, other applications running, camera

Advanced automation:

Parallel execution

Record and playback, drag and drop, reusable artifacts

Integration with CI/CD/DevOps platforms & methodology



Complementary services:

Visual testing, accessibility testing, usability testing including application monitoring & analytics, crowdtesting

Amdocs solution for mobile testing



Adjusting the best of breed partner solution per customer need

Integrated with  GINGER Automation

for a centralized solution

Amdocs to set-up and manage lab & provide advanced mobile testing including automation

Why is Amdocs the preferred solution?

- Knowledge of entire eco-system to best implement scenarios and address issues
 - Front-end & backend IT Telco expertise
 - Telco business knowledge
- One stop shop of leading market tools integrated with our BEAT management system & Ginger automation platform leveraging open-source tools
- Amdocs experience in leading agile, waterfall, hybrid, CI/CD or full DevOps methodology including integration with open-source & commercial project management & development platforms

Mobile testing solution values



Quicker TTM – ability to support frequent releases

Tester no longer wastes time managing “IT” issues (connectivity, installations etc.)
Increase automation/ integrated with continuous integration (automated regression)
Quick support of newly released devices and OS
Effective support of onshore/offshore collaboration



Increased quality

More real-life/ “production-like” parameters are tested
Reduce escaping defects by increasing testing coverage

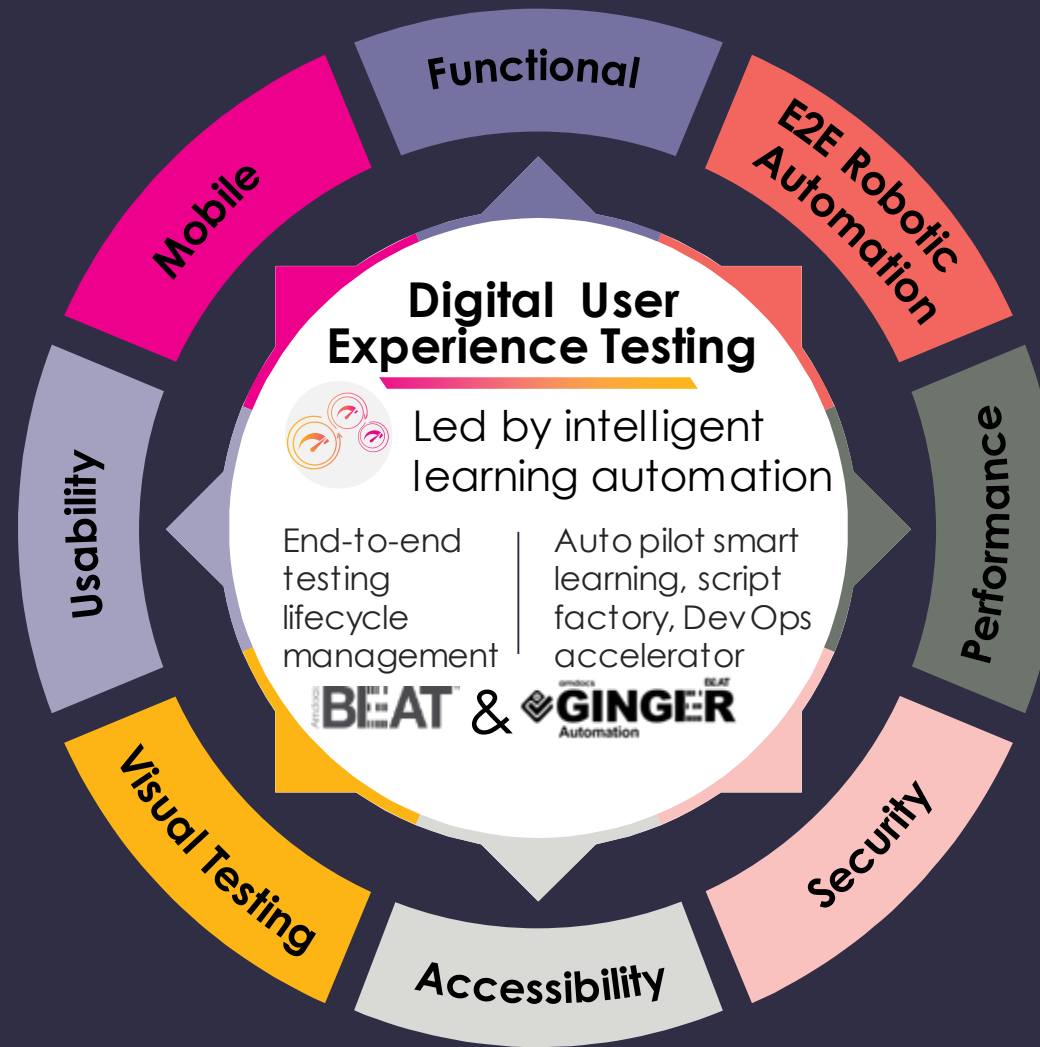
- More test cases with automation
- More device types with efficient device management



Reduce Cost

Offshore testing by enabling remote testing
Reduce manpower by increasing automation

Amdocs **DUET** - Usability Testing



Usability

Usability checklist

Rich usability checklist to cover various KPI types, such as:

of clicks to complete flow, time to complete flow, ease of data entry such as dropdowns instead of free text, GUI look and feel such as alignment etc.

Crowdtesting

Crowdsourced testing & feedback solutions with partner Applause

Testing by real people on real devices in locations around the world just like your end-customers

Usability intelligence via analytics

Tracking real users on mobile and web application and running analytics to proactively identify areas for improvement including segmentation for prioritization and drill-down for trouble-shooting

Pre-Production

Post-Production

Intelligent usability via analysis

End user struggles need to be understood and handled quickly



85% of organizations find that understanding why customers struggle in the digital experience and what the impact is on revenue is a major challenge

Usability challenges affect multiple stakeholders

The end user:

“I’m stuck, I want to complete the transaction and don’t know where to click”

Architect/Designer:

“Are the customers using the app as expected”?



CSR:

“Can you please describe what you did again? It works fine for me”

The business:

“Why didn’t we meet the expected conversion rates?”

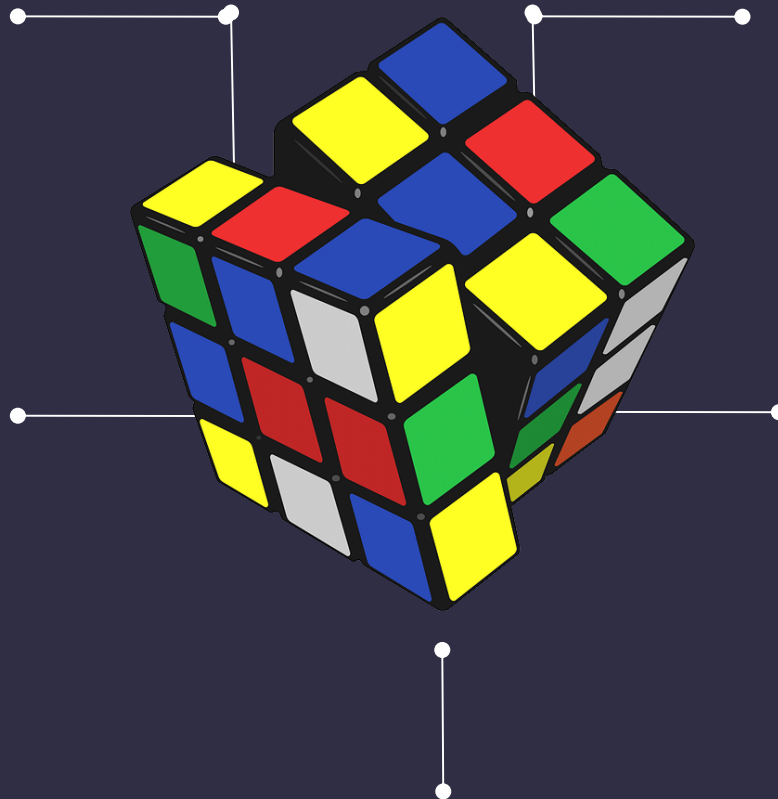
IT & business:

“Can we identify and address the most common customer struggles even if they didn’t generate system errors?”

Usability solution challenges

Many usability issues don't generate errors; IT solutions identify system errors

Most analytics solution require expensive tag development & maintenance; only partial data is tracked; no retroactive solution



Difficult to replicate issues for trouble-shooting

Enterprises require a high level of security and scalability at an affordable cost

Difficult to extract business value from analytics solutions – they provide quantitative data and not qualitative data

Intelligent usability via analytics



What? Visual insights into digital blind spots using monitoring with advanced analytics

Why? To ensure product is used as intended
understand end users' real challenges
detect churn
Identify fraud/e-crime
facilitate troubleshooting and prioritization

How? Capture & monitor customer activities on website & mobile apps and apply advanced analytics

Gain **Optimize customers' digital experience on web and mobile platforms by identifying and facilitate remediation of usability issues**

Amdocs solution for intelligent usability via analysis



Leading
innovative
solutions

Enterprise-grade monitoring of end-users & analytics
without the need for expensive tag-management

Capture and index all customer activity on web &
mobile apps for instant free-text search & session replay

Amdocs leads implementation from analyzing business
KPIs to implementation using the tools, maintenance,
tracking, recommendations based on alerts & reports

Why is Amdocs the preferred solution?

- Amdocs comprehensive understanding of entire eco-system to ensure business KPIs are addressed and translated precisely to technical implementation to extract maximum value
 - Expertise in front-end and backend IT Telco systems
 - Telco business knowledge
 - Expertise in leading innovative tools

Values



Increase customer satisfaction & stickiness, reduce churn

- Enhance customer experience via quick troubleshooting
- Proactively identifying and handling usability issues of all kinds even before they are reported
- Enhanced customer support via session replay



Increase Revenue

- Identify and handle issues effecting revenue
- By prioritizing monetary zones and issues encountered by VIP users
- Increase conversion rate by at least 1% based on past experience
- Identify business opportunities



Reduce Cost

Significantly reduce trouble-shooting process

Usability testing via crowd testing



Amdocs crowdtesting



Partnership



Leading
market
solutions

Crowdsourced testing to test applications by people who match your customer's demographics, using the devices, OSes, browsers, carriers and from the same locations as your customers do, worldwide

Gather objective **and subjective** feedback and communicate directly with development team via convenient platform

Why is Amdocs the preferred solution?

- As the leading testing vendor in the telecommunication industry, Amdocs can best scope, plan, manage and track crowdtesting based on their experience testing 30+ tier 1 telecommunications customers worldwide
- Knowledge of entire eco-system to best define & manage testing & address issues
 - Front-end & backend IT Telco expertise
 - Telco business knowledge
- Experience with all methodology and their supporting technologies from agile, waterfall, hybrid, CI/CD to full DevOps

Values



Quicker TTM

- Hundreds of thousands of testers on-demand with virtually no ramp-up time
- Testers available to work simultaneously



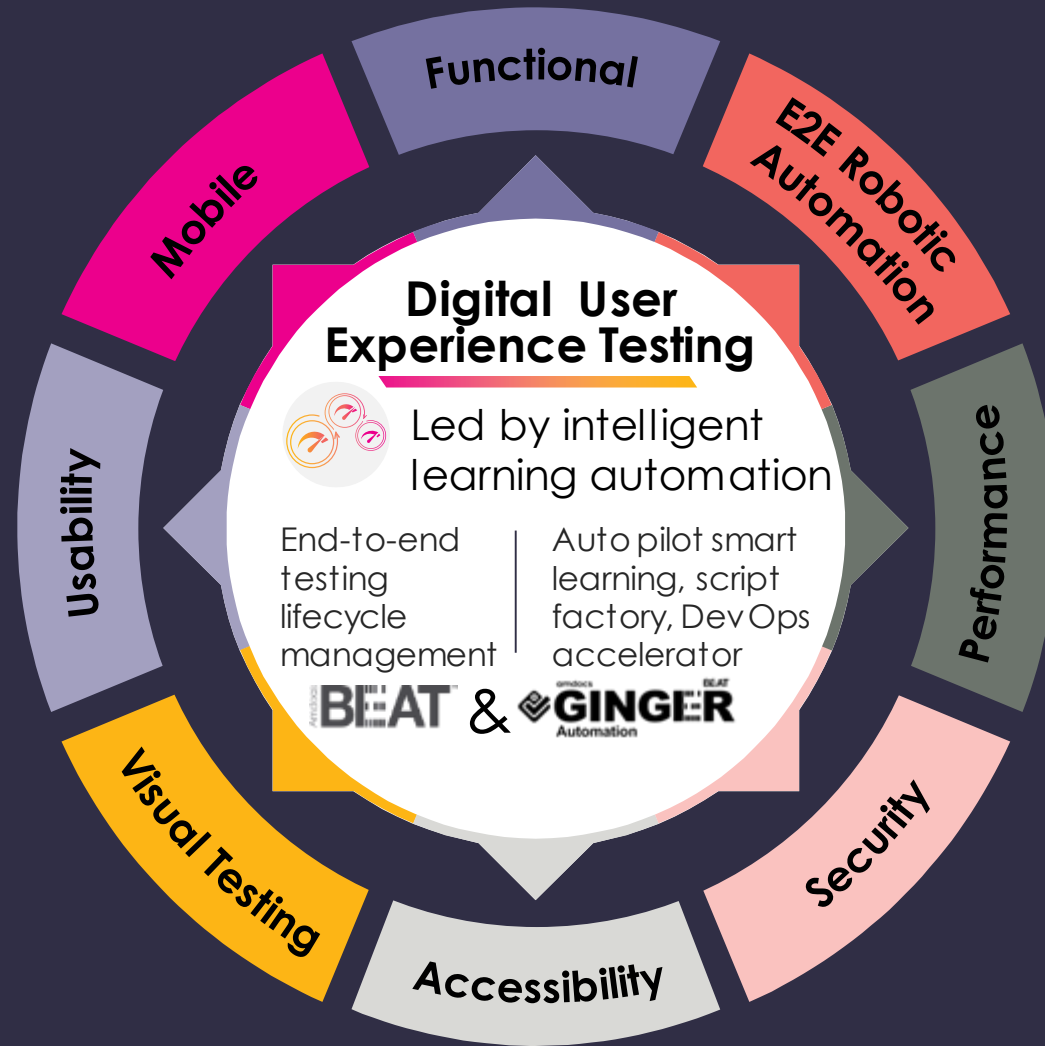
Increased quality

- Targeted coverage by allocating testers to match demographics
- Finding issues that cannot be found in the lab, before your customers do

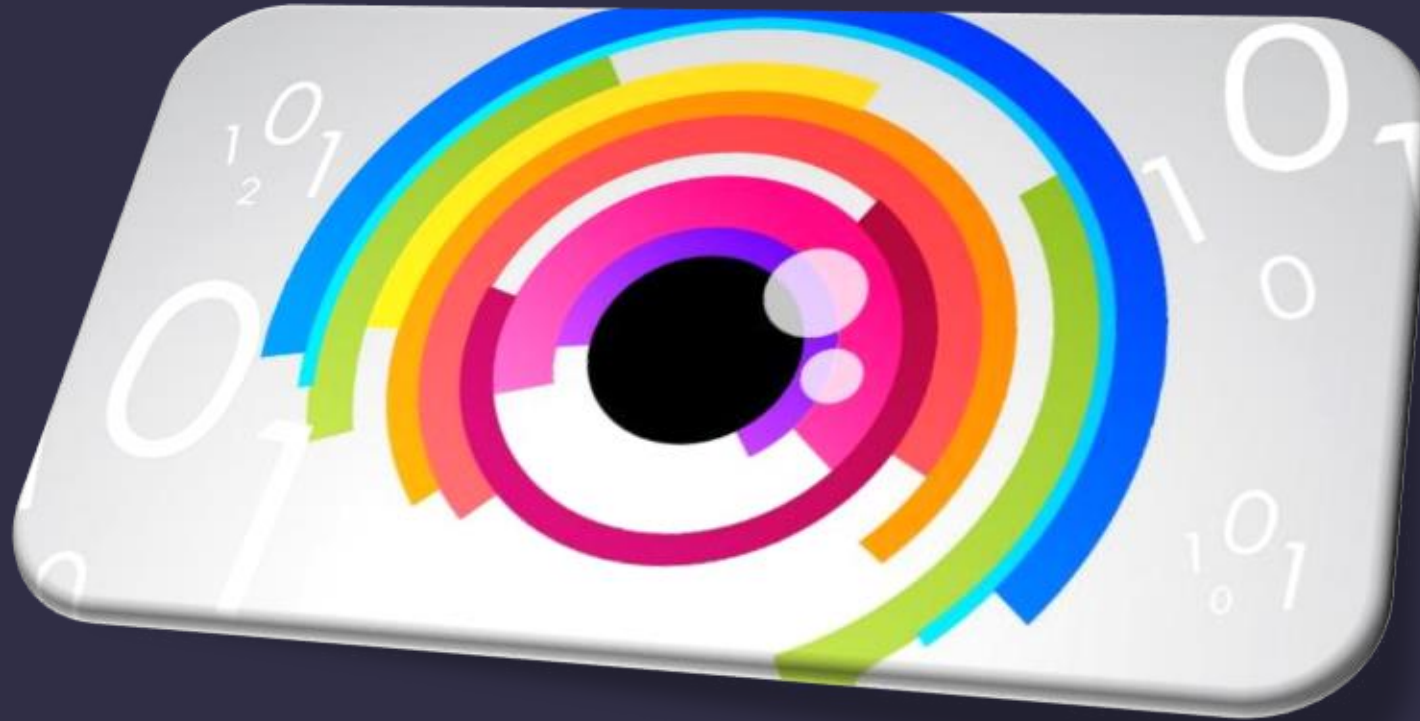


Reduce Cost

- Reduce overhead costs



Visual testing



High % of escaping defects related to visual issues

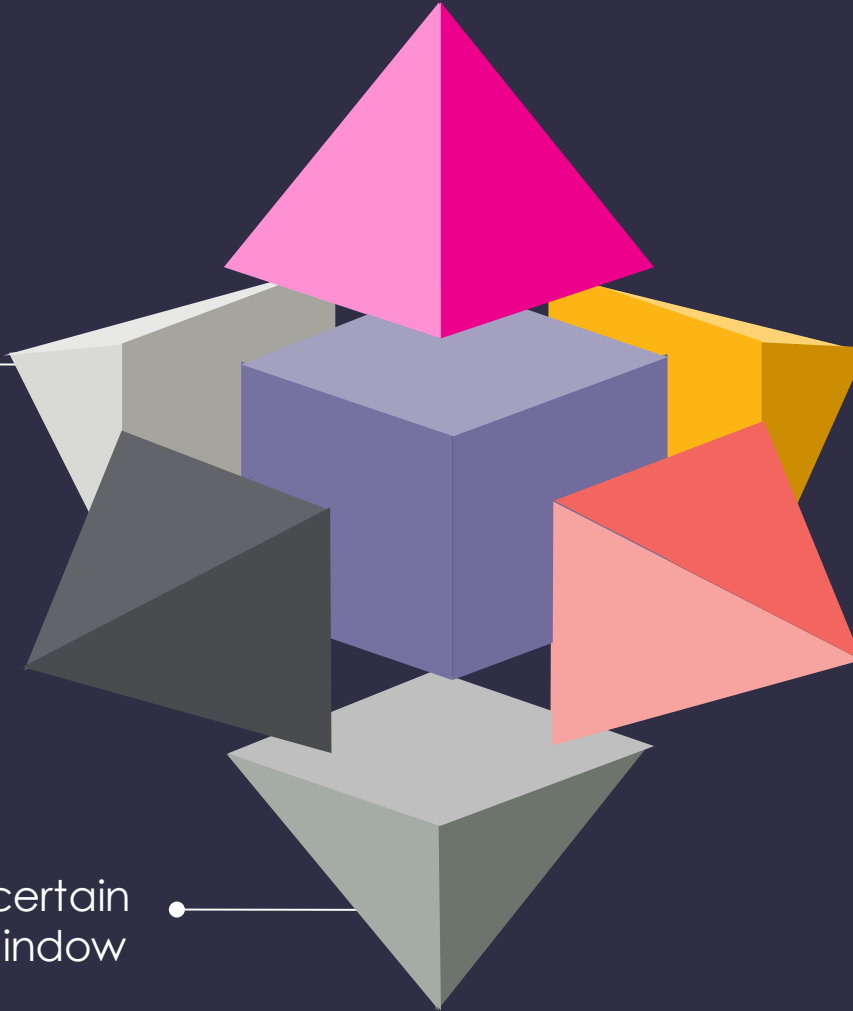
Visual defects may block business critical capabilities

Visual testing challenges

Difficult to identify visual defect manually

Tools comparing GUIs show many false positives; difficult to detect significant differences/defects

Some defects only appear on certain devices/screen sizes, or when resizing window



Amdocs solution for visual testing

Partnership



Integrated with



- Automated solution for quality assurance of visual elements on web and mobile
- Leverages leading market tool Applitools, open-source ImageMagick and Amdocs advanced Ginger automation platform

Why is Amdocs the preferred solution?

- The only pre-integrated automated solution; using our advanced Ginger automation platform
- Amdocs experience in leading waterfall, agile, CI/CD or full DevOps methodology including integration with open-source & commercial project management & development platforms
- A winning combination of leading commercial & open source tools, Amdocs Telco business and IT expertise and to assist with planning, prioritization and root cause analysis

Visual testing Values



Higher Quality

Reduce human error by automating the validation process
Increase coverage – ability to test additional screen sizes due to automation
Includes regression; verify any code change (even backend) didn't impair GUI



Quicker TTM; More Releases

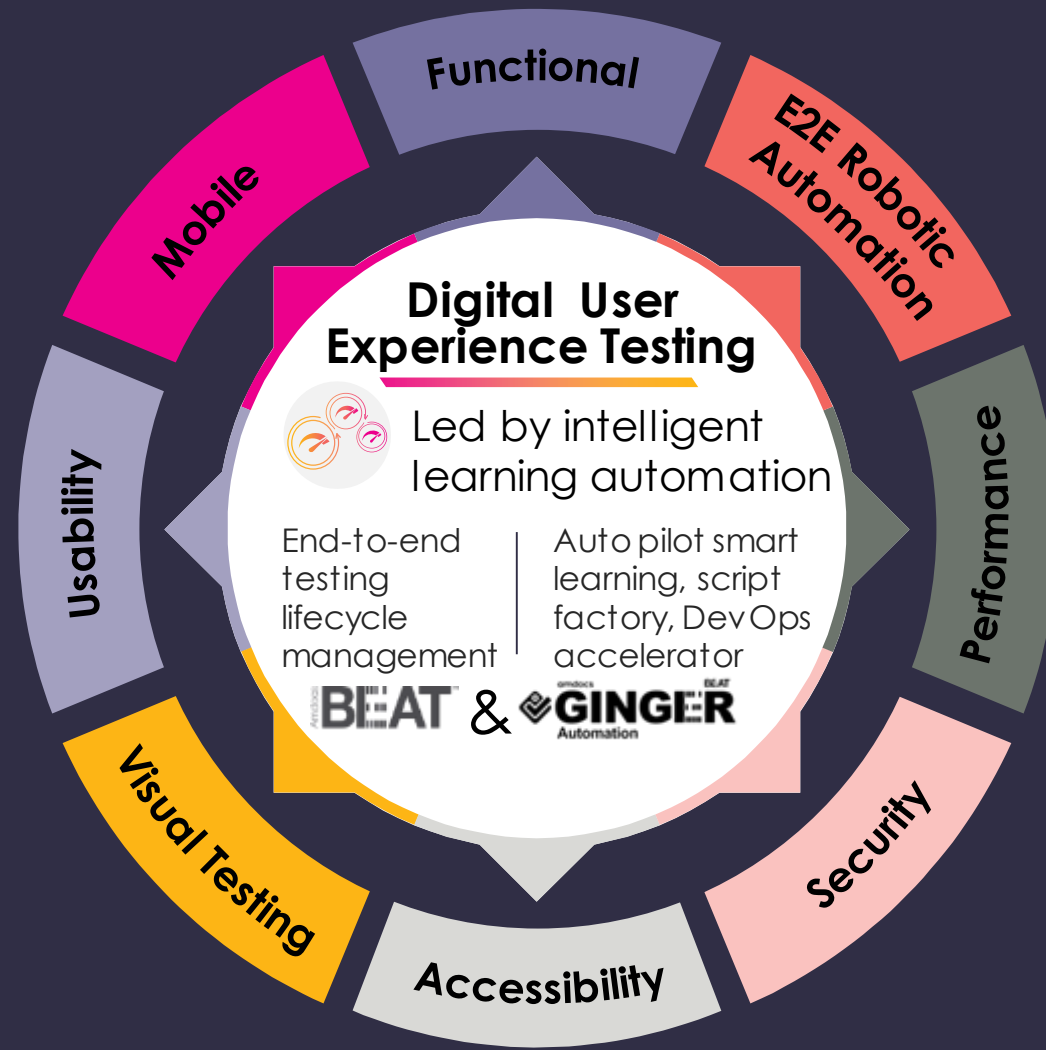
Faster delivery due to automation



Reduce Cost

Reduce manual effort
In-house advanced automation tool – no license fee

Amdocs **DUET** - E2E Robotic Automation



E2E robotic automation



Advanced end-to-end human-like testing by robots to test integrity, availability and performance of Digital offering

Motivation

User journey focused on optimized experience requires human-like capabilities

Fully integrated E2E testing is hard to simulate, (especially when moving to microservices architectures) -requires moving to production environment

Different owners responsible for different areas; lacking strong holistic view

Multiple rapid releases

Challenging to implement a full automated solution across multiple touch-points with varying technologies

Manual tests are prone to human error – defects can be easily missed



a community of always available friendly users on testing or production environments

Ensure a successful user experience before the real users

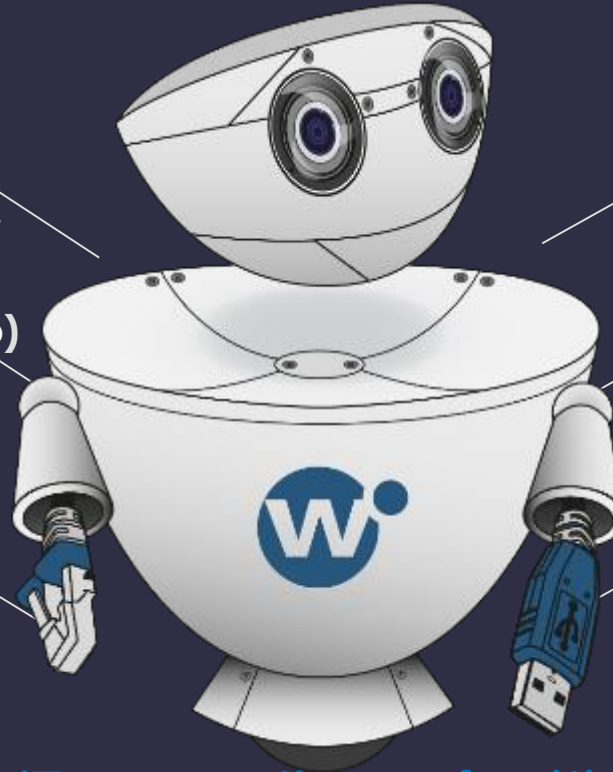
Imagine you have a **ROBOT**

Test and monitor any service on any device connected to any network

Connected to any services like your customers

Interact with any window based app on any device, over any network & location (websites, mobile applications, IVR,STB,video)

Acting like your customer: typing, scrolling, buying, selecting, searching. Watching, dialing, speaking, texting



Measuring the quality like your customers: Availability, performance, integrity and producing alerts and reports

Provide **real time information** about the end-to-end services delivery for QoE KPIs

One central repository for drag-and-drop test definition and all test results

24/7 execution of critical user transactions

Objectivity

Never tired, never angry, never hungry

Partnership



Testing leader vendor in the communication industry

Leading vendor in the QoE, testing and monitoring the actual QoE being delivered to the end user

Amdocs tools, capabilities and enablers

With QoE innovative technology by Robots

Automating the entire life cycle



Integrated test automation platform and proactive monitoring

all the way back to the **back end**

From the **front end** certified all devices and services

Certification of back-end systems (billing, proposal, CRM, claims system...)



Ensures end user quality experience



E2E robotic automation values



Higher Quality

Reduce # of escaping defects when implemented pre-production
Proactively raise errors found in production with alerts and reports
Reduce risk of human error



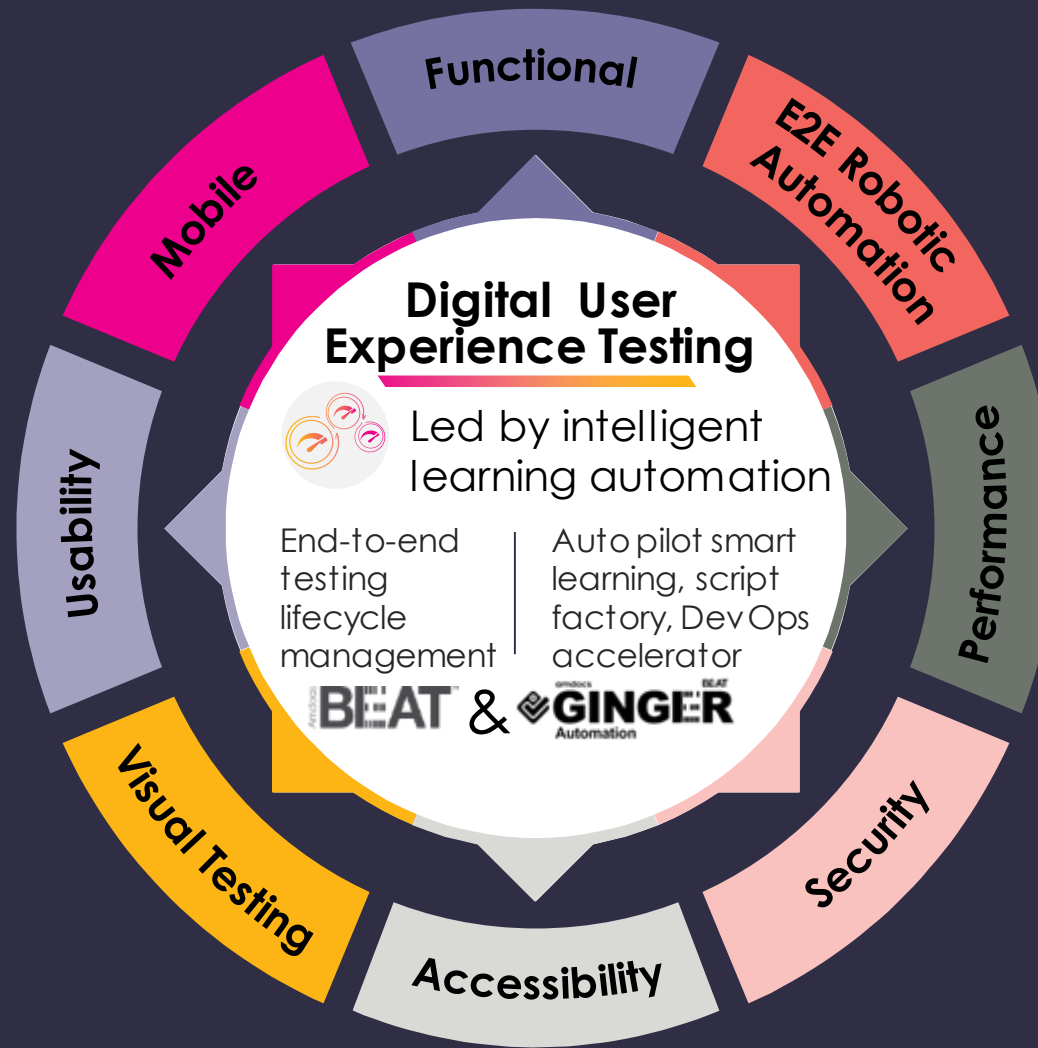
Quicker TTM

Automating pre-production testing



Reduce Cost

Scheduled automation to reduce manpower
Robots replace testers



Accessibility compliance



How would you access the web if...



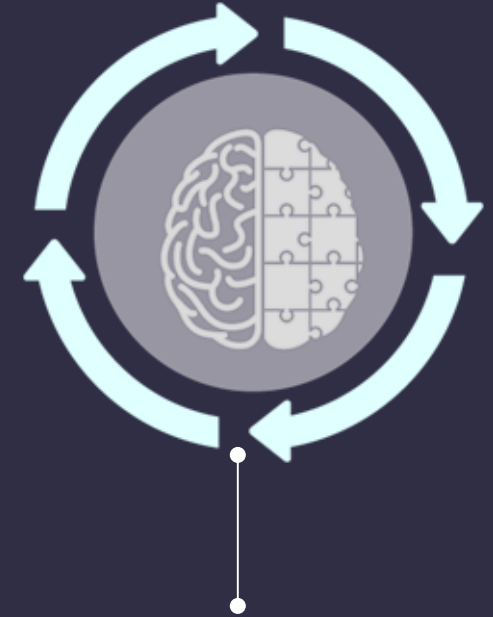
You couldn't see
the screen?



You had
difficulties
hearing the
sound?



You had trouble
using a mouse
or keyboard?



You had
cognitive
difficulties?

The necessity of compliance



Market reach

Over a billion people have some form of disability.

In the uk, 75% of disabled people said they left a business due to lack of accessibility

Those who left a phone or internet provider had spent £40 monthly



Legislative regulations

Countries around the world have **laws** to ensure accessibility

Wcag 2.0 of the world wide web consortium (W3C) is the de-facto standard

The us has an average of 24 accessibility related lawsuits filed per day
Target paid \$9,738,864 penalty



Social responsibility & Pr

We strive towards a **fully inclusive society**

Accessibility compliance challenges



High Complexity & TTM

- Hundreds of web pages updated regularly; different flows for different profiles
- Dozens of compliancy rules
- Several screen readers must be checked in addition to the various browsers, OSs and device types



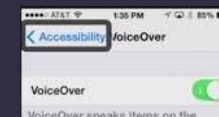
High Investment

- Requires specific expertise
- Additional investment in code development
- Deployment of accessibility code fixes to production must be incorporated into project lifecycle



High Maintenance

- High % of escaping defects
- New code can break compliance - requires ongoing monitoring
- Scanning tools generate high # of false positives
- Accessibility issues are often identified and handled at the end of the development cycle



Accessibility compliance makes the development process 5%-15% longer while the testing is 200%-300% longer



Amdocs solution for accessibility compliance

Ensure websites and mobile applications are accessibly complaint by identifying accessibility breaches and remediating them



Partnership



Leading
innovative
solutions

Amdocs will conduct the full cycle of planning, implementation, testing, maintenance and remediation using advanced BEAT tools combined with leading innovative tools to:

- Automatically scan websites & responsive websites for mobile devices to identify accessibility breaches
- Remediate errors by generating code remediation and deploy as an overlay
- Real-time dashboards for compliance progress

Why is Amdocs the preferred solution?

Combination of Telco business and Telco IT expertise together with accessibility expertise and innovative advanced tools to best implement and manage accessibility compliance efficiently and effectively

Amdocs Accessibility Compliance Offering

Tools



Leading 3rd party innovative cloud solution with Amdocs BEAT to provide following unique abilities:

- **Error prioritization, grouping and regression capabilities** for testing to focus on real issues
- **Test on-demand API** to support CI/CD platform and methodology
- **Wizard to generate code remediation** & patented solution for **on-demand deployment** eliminates dependency on development
- **Dashboards for compliance progress** – stats on real users profiles using assistive technology via patented solution plus analytics API
- **Scanning of design mockup** to identify potential breaches and provide development recommendations

People



- Expertise in compliancy, website testing and Telco business
- No need for expensive developers to remediate code
- Disabled people as part of the testing team

Processes



- Supports shift-left and shift-right; addresses accessibility in all phases from design to production, inclusive
- Flexible prioritization at all stages of the project for a dynamic, business driven solution
- Adaptable solution to match your needs – tailor-made process with the tools you need

Accessibility compliance values



Higher Quality

- Increase coverage with automation and integration to CI/CD
- Errors are mapped to their physical location on web page for easy trouble shooting
- Tackle first high priority errors & flows leveraging our accessibility & Telco business expertise



Quicker TTM

- Make code accessible without disrupting the development cycle using patented technology to deploy fix as an overlay
- Automation with parallel execution and built-in scheduler reduces manual effort
- Built-in regression capabilities to focus on new errors only; no re-work



Reduce Cost

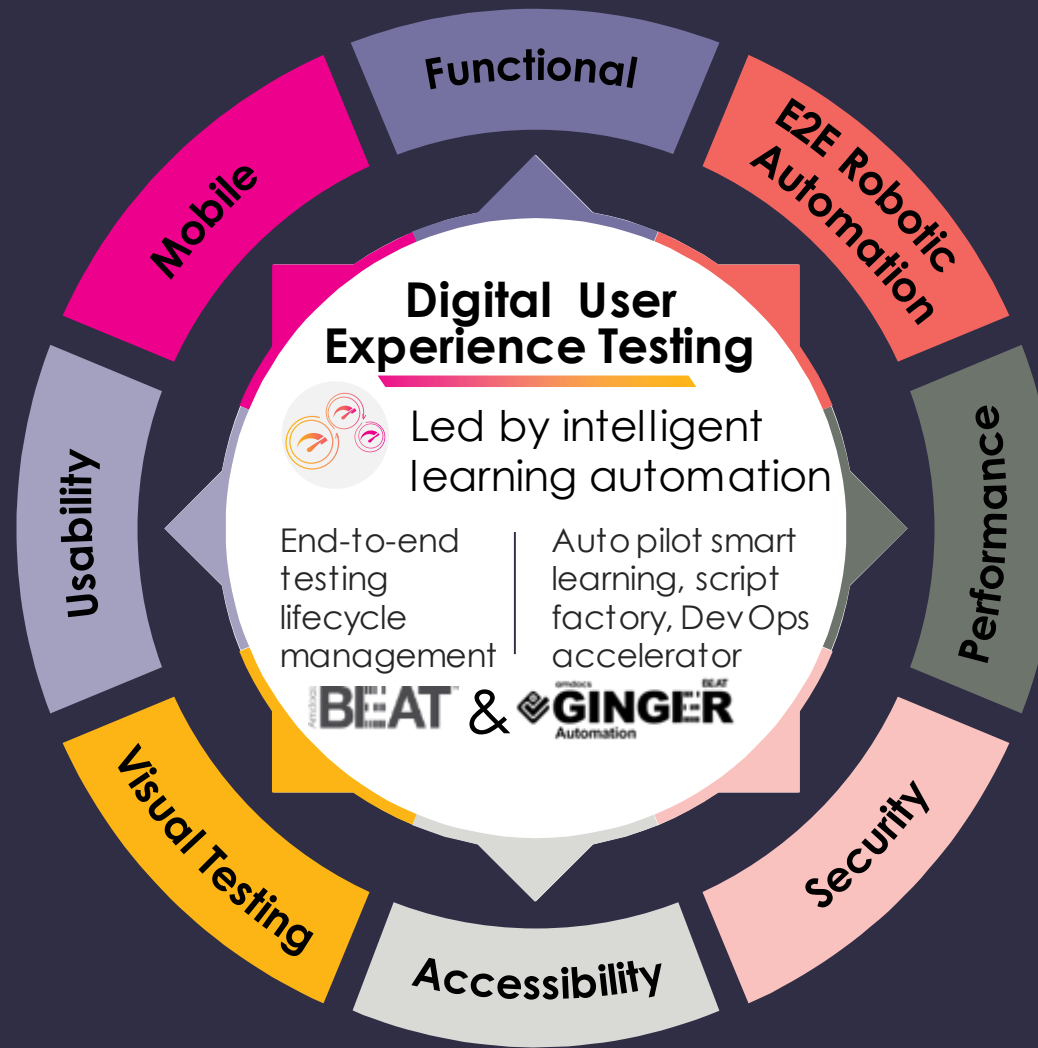
- No need for expensive developers for code fixing; tool generates remediation layer
- Reduce resources invested in false positives, duplicates and low priority errors



One stop shop

- End-to-end solution from assessment, design, execution, fixing and deployment
- Supports shift left & shift right - addresses all phases of project from design to production
- Compliancy dashboards and analytics API on coverage, types of errors and disability type via patented technology

Amdocs **DUET** - Performance



Digital performance testing



Non-functional testing to determine system parameters for responsiveness and stability under various workloads



Amdocs solution for digital performance testing

Partnership



NV Insights
NV Analytics



AppPulse Trace



dynatrace

amdocs

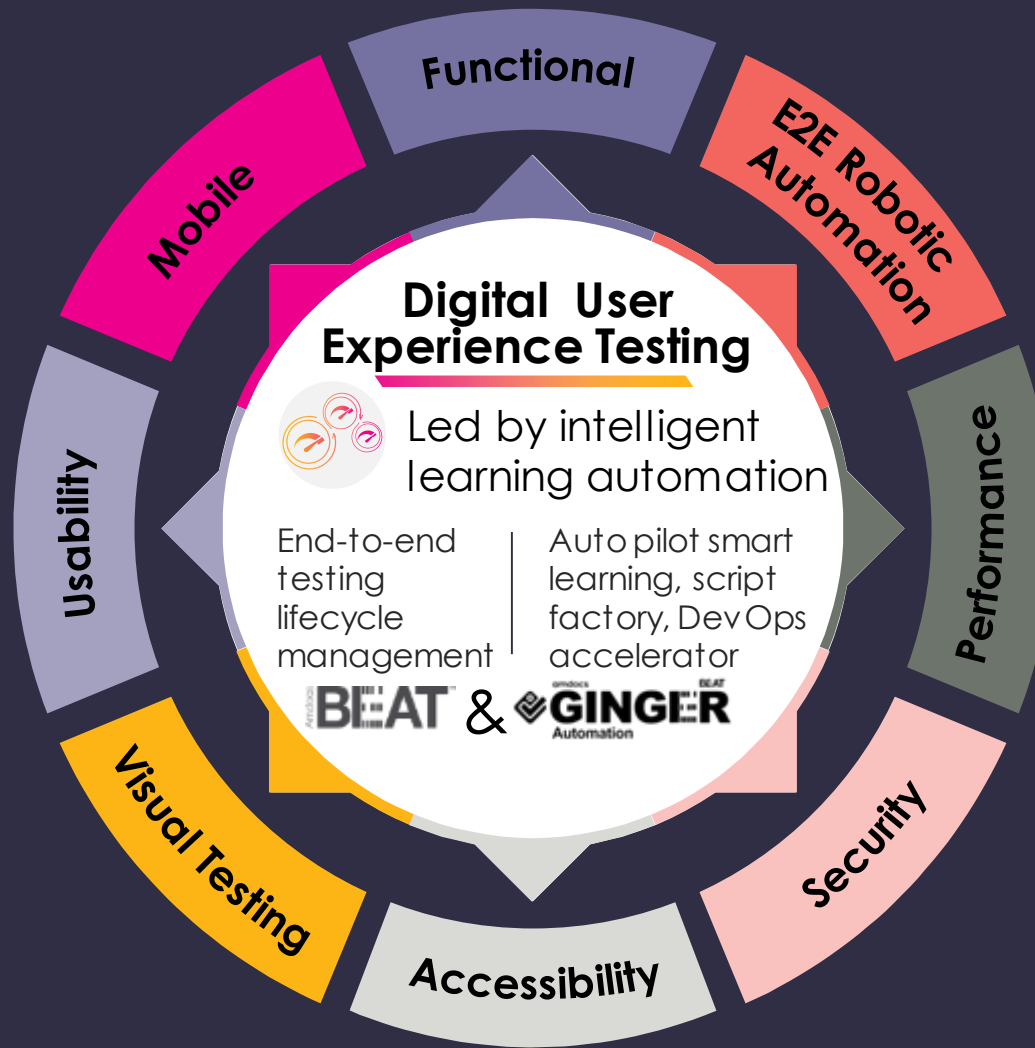
Integrated with OneView

- **End user performance** testing on cross browser, devices on varying network conditions
- **Microservices**, monolith and streaming applications
- CI solution for API performance testing (using Jenkins/Bamboo with LoadRunner/SOASTA/Gatling)
- Shift left testing early with automated APIs test suite
- Shift right monitoring to production behavior & defining scenarios with production data (RUM-end user, Kibana – backend logs) analytics
- Testing video streaming apps (live or on-demand) streams (HLS, MPEG)

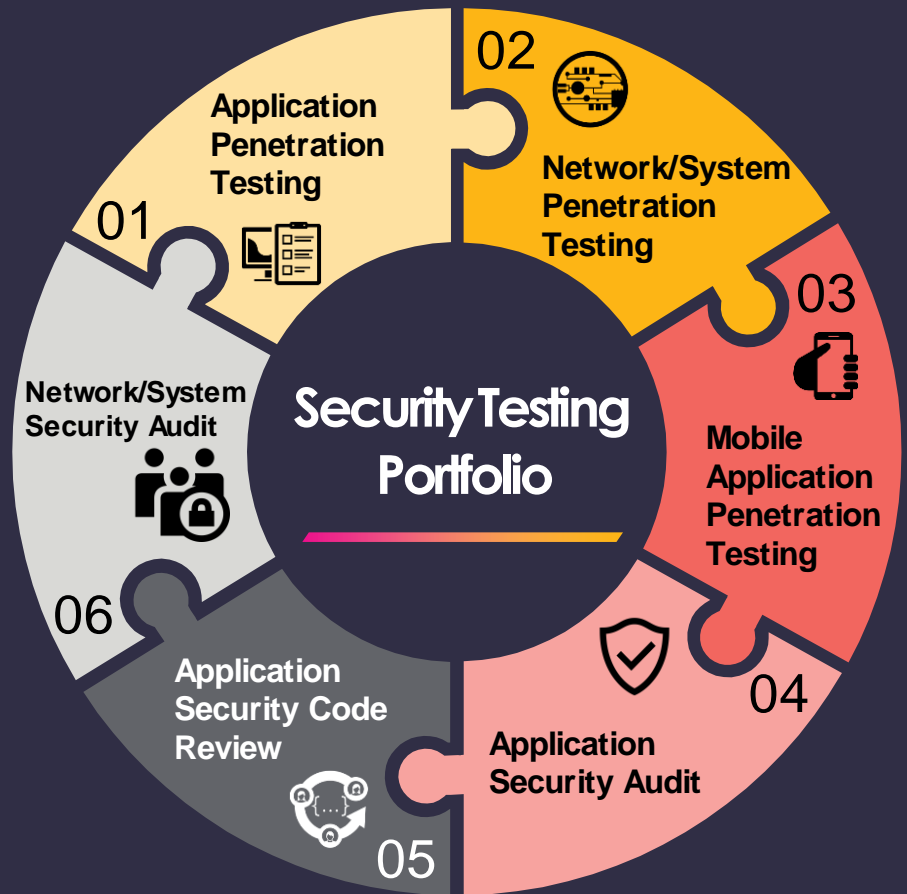
Why is Amdocs the preferred solution?

- Amdocs CI performance framework testing solution to test earlier, faster and more frequently
- Amdocs OneView in-house solution for one centralized view of real-time test data analytics with historical analysis
- Google certified testers for deep profiling & tuning recommendations
- A winning combination of leading commercial & open source tools and platforms, Amdocs tools, Telco business and IT expertise (backend and front end) to cover entire lifecycle from all angles





Comprehensive solution to address all needs



01. Application Penetration Testing

Vulnerabilities in Web applications, Thick Client applications, SOAP/REST web services

The attacks/tests mainly focus on the application layer and tries to exploit application functionality

02. Network/System Penetration Testing

All system components like web servers, databases, ESB servers, proxies, firewalls tested

Main focus is on the lower TCP/IP layers and other protocols at the network layer.

This identifies known issues on OS / middleware and COTS components

03. Mobile Application Penetration Testing

Vulnerabilities in Android, iOS etc. platforms

Testing mainly focus on issues in the mobile application workflows and activities, permissions, data access, data storage at device.

Includes reverse engineering the client side code for security weaknesses

04. Application Security Audit

This activity identifies and gathers evidences where a security test may not sufficiently address a security requirement/guideline.

Majorly focuses on compliance statements from vendors and spot checks

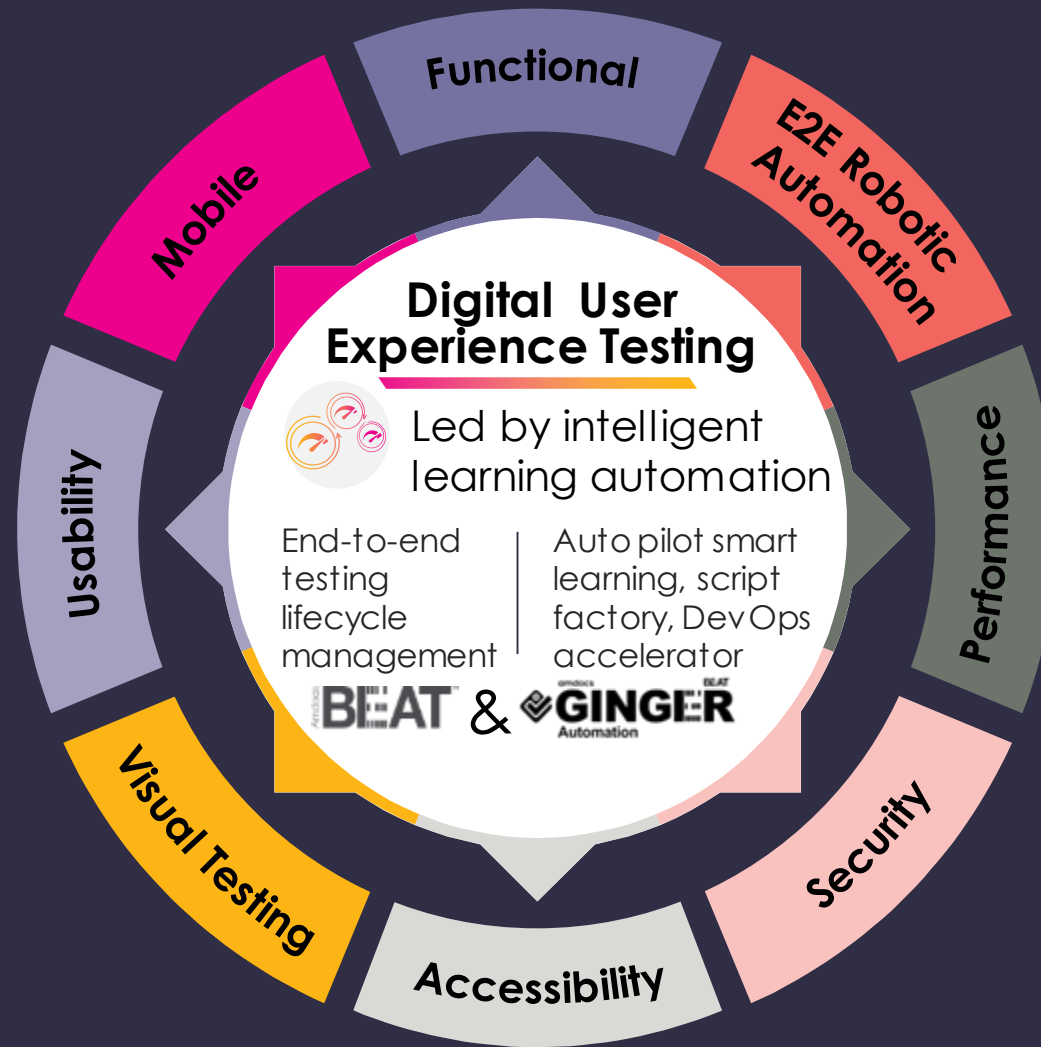
05. Application Security Code Review

Secure Code Review is the process of auditing the source code of an application to verify that the proper security controls are present, work as intended and have been invoked in all the right places

06. Network/System Security Audit

Network/system security configurations audit.

System Hardening audit as per industry standards like CIS, NSA etc.



DUET case study 1

BUSINESS CHALLENGES

- Increase percentage of online sales
- Adaptation to Dev Ops, with major releases planned every month

120M multiplay subscribers:
(broadband, mobile, IPTV, satellite TV, CVoIP, prepaid & postpaid)

SOLUTION

- Implementing modernization, testing mobile & web including user experience flow
- Test management and execution for digital services
- **Selenium & POM** automation framework for regression
- Implement **in-house tools** for efficiency improvements
- Established testing **best practices** (browser/OS coverage)
- **Using mobile labs** to enable effective use of mobile devices for testing
- **Automated dashboard** provides standard report templates for all website projects

RESULTS

- Provided **thought leadership** and defined **mobile testing strategic direction**
- => Mobile traffic on website grew 54%
- Satisfied customer - led to extended contract duration and its expansion to additional business areas

DUET case study 2

BUSINESS CHALLENGES

- Increase online sales
 - Time to market (industry competition)
 - Digital sales fragmentation complexity (many devices, OS, browsers, mobile applications and network connectivity types)
- Performance (slower page response time, resulting in consumer abandonment)
- Multiple releases (monthly, weekly, daily)

ecommerce website has monthly average of ~75 million unique Visits

SOLUTION

- Test management and execution for digital services
- Robust automation testing framework, covering all major platforms and providing a holistic automation solution
- Performance testing at early stages, including client-side and back-end performance testing
- Implemented mobile lab for effective use of mobile devices for testing
- Automated dashboard for standard report templates for all projects
- Provided thought leadership and defined mobile testing strategic direction

RESULTS

- Reduced release testing cycle time via automation and efficiencies
- Mobile traffic on the website grew 62% due to strategic direction conducted
- Satisfied customer – contract extended

Thank you

