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**
- **Community**
- **Creation**
- **Curation**

**Personal, intelligent experiences**  
**Enthusiastic brand advocates**  
**Seeking control and empowerment**
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
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:

1. Reduced online conversion rates: 43%
2. Reputational damage: 38%
3. Preventing repeat business: 30%
4. Eroding online revenue potential: 28%

ONE point increase in Forrester’s Customer Experience Index led to $175 million revenue gain for a wireless provider.

Sources: Walker, UserReplay
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

End user

www.amdocs.com/dt
LEVERAGING AMDOCS’ FRONT END & BACK END EXPERTISE, TOOLS AND COLLATERAL

ENRICHE VIA AMDOCS’ PARTNERSHIP WITH LEADING DIGITAL TESTING VENDORS

front end
Mobile devices, browsers, user interface....

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

- **Mobile**
  - Lab management, device vitals & network

- **Usability**
  - App monitoring & analytics, Crowd-testing

- **Visual Testing**
  - Cross-platform validation of GUI

- **Accessibility**
  - Accessibility compliance, Testing & remediation

- **Functional**
  - Regression, compatibility, End-to-end, Data generation, Tag testing

- **E2E Robotic Automation**
  - Robots simulating end-to-end end user behavior

- **Performance**
  - Load, Stress & stability, Network virtualization monitoring

- **Security**
  - Penetration testing, Security audit code review

Digital User Experience Testing

Led by intelligent learning automation

End-to-end testing lifecycle management

Auto pilot smart learning, script factory, DevOps accelerator

**BEAT** & **GINGER** Automation

Based on Amdocs Testing platform BEAT - automating the entire cycle
Is it working?
- Functional
- Integration
- Platform
- E2E
- Regression

Are we able to delight the customer?
- Application monitoring & analytics
- In the wild exploratory testing

Is it usable, secure, fast and reliable?
- Security
- Performance
- Usability
- Visual
- Compatibility
- Accessibility

Is it delivered faster, better and efficiently?
- Advanced automation
- Productivity improvements, reuse
- Early testing

Amdocs DUET - Comprehensive offering to cover all digital aspects
Digital testing services landscape has expanded

From digital user experience quality assurance...  ...to business assurance

Pre-production  Post production

- Functional
- Visual Testing
- Performance
- Mobile
- Usability
- Accessibility
- Security
- E2E Robotic Automation

From digital user experience quality assurance...

...to business assurance
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

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

Pick and choose approach

Specific services are offered to address specific digital needs to enhance digital offering
Amdocs DUET: Amdocs platform and enablers

Digital User Experience Testing
Led by intelligent learning automation

- End-to-end testing lifecycle management
- Auto pilot smart learning, script factory, DevOps accelerator

- Functional
- Mobile
- Usability
- Visual Testing
- Security
- Accessibility

E2E Robotic Automation

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Led by **Amdocs automation** tools and enablers

Automating the entire life cycle
Amdocs BEAT™—automated E2E testing life cycle

From the early stages of planning and scoping up to 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**
Amdocs DUET - Mobile Testing

Digital User Experience Testing
Led by intelligent learning automation

- End-to-end testing
- Lifecycle management

- Auto pilot smart learning, script factory, DevOps accelerator

Functional
E2E Robotic Automation
Usability
Performance
Visual Testing
Accessibility
Security
Mobile testing motivation

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

Source: Wow Local Marketing
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

Partnership

Adjusting the best of breed partner solution per customer need

Integrated with

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
  o Front-end & backend IT Telco expertise
  o 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

Integrated with

Adjusting the best of breed partner solution per customer need
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
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.

Sources: UserReplay, Accenture
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 solutions 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

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

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
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

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
Digital User Experience Testing

Led by intelligent learning automation

End-to-end testing lifecycle management
Auto pilot smart learning, script factory, DevOps accelerator

Amdocs DUET - Visual Testing
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
- Some defects only appear on certain devices/screen sizes, or when resizing window
- Tools comparing GUIs show many false positives; difficult to detect significant differences/defects
Amdocs solution for visual testing

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

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
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

Digital User Experience Testing

Led by intelligent learning automation

- End-to-end testing
- Lifecycle management
- Auto pilot smart learning, script factory, DevOps accelerator

Functional
E2E Robotic Automation
Mobile
Performance
Usability
Visual Testing
Accessibility
Security
E2E robotic automation

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

Ensure a successful user experience before the real users

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

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

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

Challenging to implement a full automated solution across multiple touch-points with varying technologies
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 tried, never angry, never hungry
Partnership

Testing leader vendor in the communication industry

Amdocs tools, capabilities and enablers

Automating the entire life cycle

With

Amdocs BEAT Analytics

Integrated test automation platform and proactive monitoring

QoE innovative technology by Robots

all the way back to the back end

From the front end certified all devices and services

Ensures end user quality experience

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

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

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.

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

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

Partnership

Leading innovative solutions

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
Digital User Experience Testing

Led by intelligent learning automation

End-to-end testing lifecycle management

Auto pilot smart learning, script factory, DevOps accelerator

Amdocs DUET - Performance

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Digital performance testing

Non-functional testing to determine system parameters for responsiveness and stability under various workloads
Amdocs solution for digital performance testing

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

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)

Integrates with OneView

Partnership

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Amdocs DUET - Security

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Functional
E2E Robotic Automation
Mobile
Usability
Performance
Visual Testing
Accessibility
Security
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.
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Amdocs DUET - Case studies
DUET case study 1

**BUSINESS CHALLENGES**
- Increase percentage of online sales
- Adaptation to DevOps, with major releases planned every month

**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

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

**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

ecommerce website has monthly average of ~75 million unique Visits

**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