DCC Integration Testing

A key role in enabling the GB National Smart Metering platform
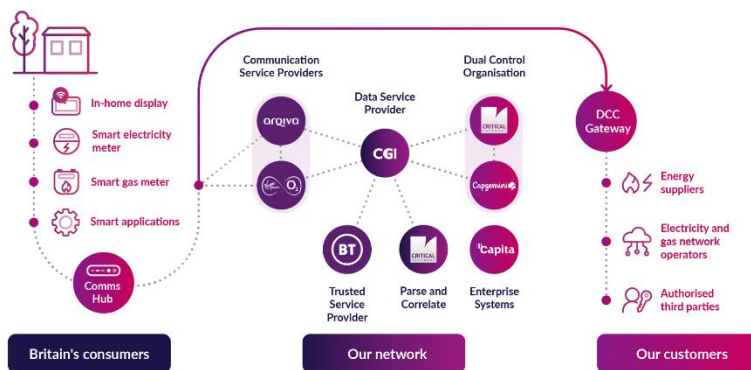
CGI Integration Testing in Smart Metering

With our expertise in the Utilities sector and Smart Metering, CGI successfully managed the integration testing of the complex, multi-vendor smart metering solution for Great Britain. Systems integration testing involved multiple vendors releasing software, hardware and firmware to be tested end to end on an ongoing basis. Over 35,000 tests have been run per year since 2016 to test the solution in a highly regulated and highly secure context. This integration testing is supported by a CGI Triage function using industry knowledge to determine the business impact of defects found in testing and use Smart Metering technology expertise to guide the component vendors to resolve issues.

The Full Story

CGI pioneered gas and electric smart metering and introduced the first ever UK smart meters in 2006. Based on our experience, CGI won the Data Service Provider (DSP) contract in 2013, putting us at the heart of the national Smart Metering systems. As a service provider to the Data Communications Company (DCC), we designed, built and operate the central systems that support the rollout and use of over 50 million gas and electric meters. Using our Cyber Security capabilities, CGI has overseen a highly secured environment that has seen the largest rollout of digital certificates in Europe.
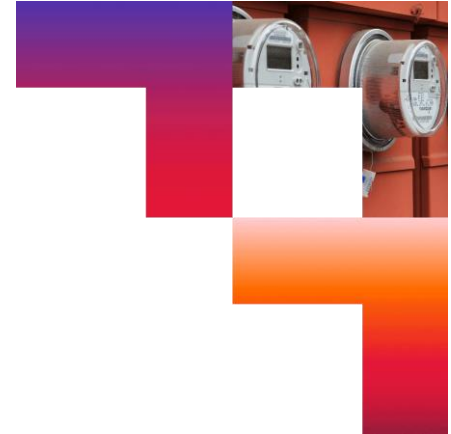
The growing DCC ecosystem of service providers is illustrated below:

Smart Metering at a Glance. Source: Data Communications Company

DCC's Systems Integrator (SI)

CGI also has the role of SI across the entire platform. As part of SI responsibilities, CGI leads the Integration Testing throughout the entire DCC ecosystem including:

Key Success Factors

- Expertise in smart metering technology
- Business domain understanding across the energy industry
- Structured, highly automated approach to integration testing on a large scale
- Testing expertise reflected in **TMM*i* Certified Level 5** accreditation www.tmmi.org/accredited-certifications/

Key benefits

- Successful integration of a complex, large scale IoT platform
- Continuous improvement including high-level of test automation reducing ongoing costs
- Delivered savings over £50M for the wider DCC ecosystem over 18 months from January 2020

- Systems Integration Testing (SIT): SIT is the first point at which all the Service Providers' (SPs') components are integrated and tested through to the meters.
- User Integration Testing (UIT): UIT extends the components in SIT to include the energy companies' and electricity network operators' systems, a Smart Energy Code obligation.
- CGI provides test execution co-ordination covering both SIT and UIT and supports with test data management, test automation, defect management and test progress reporting.
- SI Triage investigates and drives the resolution of issues encountered in SIT and UIT across all the SPs.

Our Role

CGI's role in SIT involves defining, coordinating and driving the functional integration testing across more than 10 SPs for ongoing releases in a complex IoT architecture. Emphasis is on the cost-effective regression testing of the new releases where over 90% of testing is now automated. SMEs in smart metering, test assurance, analysis, test data management, test execution and defect management work in close cooperation with the DCC's test assurance teams in a highly regulated environment.

CGI continuously improve our test methodology and have TMMI Level 5 accreditation. Improvements include a comprehensive test automation framework which achieved savings of over £50M for the wider DCC ecosystem over 18 months from Jan 2020. Testing in SIT involves over 130 different service request types, 7 different communication hub types and over 10 different meter manufacturers with multiple hardware and firmware versions in a highly secure software infrastructure. Peak CGI SIT team size was over 150.

In UIT, CGI SME's support the industry Testing Participants (TPs) who are performing their own testing. The TPs are primarily the energy distributors, energy suppliers, managed service providers and switching companies. Testing is end-to-end from the TPs' back-office systems, through the DCC's ecosystem and onto meters. In 2021 more than 4.23 million transactions were processed and 868 tickets raised, a reflection of the scale of testing involved.

CGI's UIT team provides technical support to the TPs by filtering issues before more complex issues are sent to the Triage function. A personalised support service is given with dedicated support analysts assigned to each TP. These SMEs also administer the complex test data and liaise between the TPs, the ecosystem SPs and Triage.

CGI's SI Triage lead the investigation and resolution of the issues raised in SIT and UIT testing. The team determine the SP responsible for further investigation of each incident raised, then lead investigations to a resolution and identification of the root cause. The Triage team work closely with the SP's teams and the DCC Design Authorities. This complex work requires the Triage team's business knowledge and technical expertise across the entire ecosystem.

At CGI, we are very proud of the key role we play in supporting Britain's Smart Metering Infrastructure and the impact that this will have in all our futures.

"The wealth of knowledge, guidance and expertise provided by CGI has been invaluable to support the key Testing and Assurance services to enable Test Participants to become DCC Users to aid their Smart Meter Rollout. The UIT proving activities conducted by the CGI UIT team has meant that new products and releases have allowed for a smoother Testing Service to our Users."

Reena Parmar
Head of Test Services
SmartDCC

About CGI

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world.

We are insights-driven and outcomes-based to help accelerate returns on your investments. Across 21 industry sectors in 400 locations worldwide, our 90,000+ professionals provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally

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