

Internet of Things

The Internet of Things (IoT) is being applied to a wide range of different applications, including solar panels, white goods, smart meters and bespoke sensor grids. Frazer-Nash Consultancy is ideally positioned to assist with IoT development in any operating environment.

ADVANTAGES OF IOT

Attaching devices to the internet allows them to be monitored and controlled. Monitoring domestic and commercial electronics enables cost savings by providing data on their performance. A large number of devices can be compared with each other, to anticipate failures or service requirements. The ability to control other electronics or physical devices through the internet opens up possibilities for large-scale optimisation and cost reductions. We can advise how IoT technologies can be best applied to fulfil your application requirements.

IOT HARDWARE

We have developed IoT devices using low-powered microprocessors and microcontrollers. We are able to propose solutions with the best mixture of microprocessor and microcontrollers for specific IoT applications. Our solutions will minimise power consumption and overall operating cost.

Microcontrollers are often the best solution for power-constrained applications and offer a wide range of different input/output options. We are able to develop applications with the most appropriate microcontroller hardware for a given IoT application.

Microprocessors may be more suitable when computing accuracy and speed are more important than power consumption. We have developed and deployed applications using embedded i386 and ARM microprocessors, using industry standard communication buses. We have deployed these applications with small-factor and remote storage solutions.

SOFTWARE FOR IOT DEVICES

We have a deep understanding of developing bespoke Linux applications that are suitable for IoT microprocessors and have implemented several client-server applications. We can advise on security matters, ensuring that data and devices remain fully operational and secure.

We have developed software for IoT applications in C, C++ and Python programming languages. We are a TickIT^{plus} accredited software developer, using our best practices to ensure that software fulfils client expectations. We are able to produce software applications using a range of different development lifecycles that are tailored to client requirements.

Data access, monitoring and control of IoT devices requires supporting computing facilities. We can advise on commercial services that offer IoT integration or develop bespoke supporting services as needed.

DATA PROCESSING & STORAGE

Depending on the specific IoT application, data can be processed locally or remotely. We can propose an optimal mixture of local and remote processing, balancing network bandwidth and device power considerations. Data from IoT devices can be uploaded to a remote cloud, database or file servers. We can advise on the best storage solution and schema for sampled data, to enable high-speed data analysis and long-term supportability.

MONITORING & CONTROL

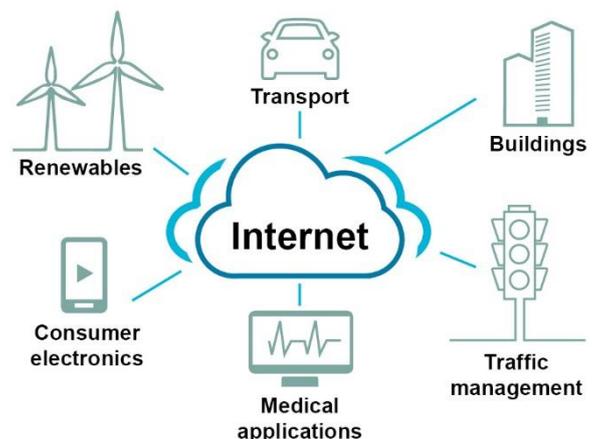
A large-scale network of IoT devices can be hard to visualise and control. We are able to create software that is tailored to your requirements, providing a monitoring dashboard or distributed control system as necessary.

Monitoring and control can be achieved using web services and distributed tools. We have designed and implemented web applications using a range of different software stacks, including Microsoft, Oracle and open source technologies. We have also developed platform-independent applications using Java and Python programming languages.

We have developed data summary applications that include geographic mapping displays. We can create monitoring dashboards that include geographic information from the Ordnance Survey or another mapping data provider.

OUR CAPABILITIES

- ▶ Detailed understanding of IoT hardware platforms.
- ▶ Comprehensive experience programming microcontrollers and low-power microprocessors.
- ▶ Wide-range understanding of supporting monitoring, control, analysis and storage technologies.



For more information about Frazer-Nash please visit our website.

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