

Midlands Intelligent Mobility Conference

Inclusive Design – Person centred Access Means Good Design
For Every-One

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Backdrop – Our Technologies.

- IOS, Android, Windows and Linux based platforms mediators to the web and information sources;
- First three have accessibility support built in;
- Information systems, machine learning, big data, able to deliver specific information on-demand and with more immediacy than ever before;
- Creating and capturing data through sensors, cameras, behaviours, and understanding patterns/informing decisions.

Backdrop – Our Expectations.

- On-demand immediate gratification, information, entertainment;
- Social media, social movement websites and rankings force good customer service or at least answers and inform Government policy;
- Google is a verb;
- Amazon has set the bar around on-line shopping practice;
- Citizens can hold governments, companies and other individuals to account.
- Behavioural change and expectations has changed as a result of technological change and adoption.

Backdrop – Underlying Ideas

- We live in a world where, concerns of privacy, hackers and information management aside, certain concepts have crept in to our lives:
- Profiles;
- Behaviour monitoring;
- Algorithms that draw conclusions about us based on others;
- Alternative user interfaces or user interfaces of choice.
- Personalised experience without even knowing.

People With Disabilities

- There are around 13.3 million people with disabilities in the UK;
- 3.4 million disabled people make up our workforce in the UK;
- The spending power of families with at least one member who is disabled is around 200 Billion pounds;
- The widest reported disabilities are mobility based (52%), Breathing/fatigue/stamina (38%), dexterity (27%).

Are The Needs Or Wants Of Disabled People Different To Those Of Non Disabled People?

No.

But the promise of intelligent vehicles, intelligent cities, and the choices they bring, are going to be revelations – or the biggest set of barriers ever experienced in the modern age.

What Are Autonomous Systems?

The future that we create, from today's standpoint, includes:

- Intelligent Mass transit public services;
- Personalised or individualised travel (pods, intelligent cars);
- Drones or autonomous delivery/retrieval systems;
- Bulk goods carriers;
- Fixed and non-fixed routes/rail/highway.

An attempt to annotate specifically driverless cars and level of automation using a 5 level system has been put forward as a means of assessing level of progress towards full automation.

But this represents a partial story of what is to come – Policy and the wider view lags behind technical innovation.

Overall Challenge.

Our ambition to deliver on “intelligent” “autonomous” systems is thwarted by current technical and infrastructure constraints:

- The race is on to develop computing power that matches human brain ability.
- Efforts to quantify computer versus brain processing speed are fraught with problems – but a well annotated example: the K computer in Japan managed to carry out 1% of brain activity that the brain conducts in one second – the K took 40 minutes of number crunching;
- Computers are mathematically designed systems with storage, processing, and aim to reproduce results with predictability. Brains make no such clear distinctions and are phenomenal at patterns, linking memory and experience to a challenge, and have “neuro-plasticity” – a means of “re-wiring” themselves based on experience, damage or requirement;
- A human being, confronted with an unknown environment and circumstance, draws on prior knowledge, grabs environmental, sensory and emotional data, seeks patterns, signs, and integrates apparently random or unsought out knowledge in to a decision, along with trial and error based on the fuzziest of logic or self-preservation.

Example: Anatomy Of A Journey

- Deciding where to go;
- Planning;
- Ad Hoc travel;
- Locating/flagging/accessing the vehicle;
- Interacting with the vehicle (on board systems or environment);
- Being informed (Where am I? Have I arrived? How long to go?);
- Interchanges;
- Assistance (either automated or person-based)
- Where am I in relation to where I wanted to be?
- The last 10 yards.
- Overlay of specific physical, sensory or cognitive challenges.

The importance Of Supporting Infrastructure And Data.

- Profiling and appropriate interpretation and outcomes;
- Accurate location data acquisition (GPS, tags and markers, granular mapping data);
- Vehicles and systems accessible by design;
- Smart city infrastructure – data sharing between systems including monitoring;
- Emergency and help structures and processes;
- Mapping, tagging or image recognition of internal structures;
- Joined up private/public infrastructure data.

User Scenario 1.

A totally blind person wants to get home from the pub:

- Summoning vehicle;
- Vehicle identifying itself/guiding person to it/app guiding person to it;
- Identifying entrance;
- Informing the vehicle (in advance or at this point) of destination;
- Knowing where you are at any point in time;
- Knowing precisely where you are about to be deposited and accurate relationship to home.

User Scenario 2.

A wheelchair user going to the shopping centre:

- Vehicle has arrived notification;
- Vehicle is located in a place that allows easy access;
- Ramp access on to vehicle;
- Journey details;
- Depositing the passenger at a location which allows non-step access to the mall.

Example 3.

A drone deliver a package to an elderly gentleman on the 4th floor of a large block of apartments?

What does that scenario look like?

User Testing And Engagement.

There are one billion people with disabilities globally and around 15% of the UK population has a disability. Through life-changes and situational changes, people need and want different treatment – a mother with a child, a person with a broken arm, a person in need of regular medication.

The interpretation of current and creation of new standards and expectations need to be tested against our diverse population.

Recommendations.

- Policy and strategy should overtly start leading development – we should see opportunity and embrace it;
- We need to consider and invest in infrastructure that will support the future transport offerings;
- We need to build proper people-centred requirements in to what is coming;
- We need to insist on universal connectivity across the UK and support mechanisms to deliver on a robust mobile infrastructure;
- We need to embrace personalisation and what that means in intelligent mobility.

Thank you.

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