

Shared Research Project

Wearables in the workplace

Research
Industry
Collaboration
Health
Tracking
Good Practice
Geo-fencing

Wearable

Validation
Hazards
Impact
Sensors
Reputation
Safety
Data Analysis
Change

There is growing evidence that wearable devices can significantly benefit health and safety in the workplace through positioning and sensor technologies. The advancement of the Internet of Things has meant that many of these technologies are increasingly being deployed, helping to improve workplace productivity.

HSE recently hosted a workshop with key industry leaders and technology providers which focused on identifying the potential benefits and challenges of using wearables for health and safety applications. A series of key research questions were developed and areas for research prioritised.

This programme will endeavour to validate the use of the technologies for workplace health and safety and to help find solutions to the key issues and barriers to effective adoption of wearables in the workplace. The priority areas to be researched within this project are:

- **Monitoring occupational personal exposure to hazardous substances and physical hazards on construction sites**
- **Musculoskeletal disorders (MSDs) in workers identified at greater risk**

In addition to taking an active role as industry leaders in health and safety innovation there are considerable benefits from early and appropriate adoption of wearables. Through this Shared Research Project sponsors will be better placed to adopt appropriate wearables technology which can enable better monitoring of worker time spent in hazardous areas, improved exposure prediction, better productivity and immediate feedback on efficiency of control measures.



HSE SHARED RESEARCH PROGRAMME

HSE has a longstanding history of supporting science and research to address a range of cross-sector health and safety issues. Building on this heritage, the HSE Shared Research Programme provides a platform to identify and co-fund applied research projects that are of interest to both industry and regulatory bodies.



Overview of Technical Work Packages

This proposed Shared Research Project is built upon the discussions and priorities set during the HSE workshop. The programme will be delivered by a series of distinct but interrelated work packages. The specific details will be reviewed and agreed on a collaborative basis via a steering committee comprising industry project sponsors and HSE. The work will be led by HSE topics specialists supported by their regulatory colleagues. Project co-sponsors will have a key role in providing direction, information and industrial application insight.

Work Package 1: Knowledge Gaps

A technical review will be conducted on wearables that can be used for the monitoring of MSDs, personal exposure to hazardous substances and physical hazards in a work environment. This state-of-the-art review will identify the latest technologies, products, applications and providers, linked to their potential value.

Deliverable

A report categorising the available technologies based on suitability, availability and costs.

Work Package 4: Data Analysis

A detailed analysis of the data collected will be undertaken to identify the benefits, common analytical approaches and barriers to using data from wearables to help reduce risks. This time resolved data will provide a rich source of information on personal exposure to a hazard for any time periods of choice and on MSD risk levels at different work sites for different tasks and for different individuals.

Deliverable

A guide to key methods and approaches to analyse and interpret data from multiple wearables to provide insight to improve health and safety outcomes and controls.

Work Package 2: Device Performance & Evaluation

A range of available wearables will be acquired and evaluated. These will be selected by the Steering Group based on the outputs from the Work Package 1 review. The evaluation will be based on the comparison of performances and characteristics (e.g. cost, data access) against standardised and traceable measurement technologies in standard conditions relevant to occupational settings. In relation to MSDs, the evaluation is likely to include, online survey of symptoms, trials with selected groups of workers (including control group), on-site observations and work logs.

Deliverable

A report detailing the performance of wearable technologies and in what circumstances they could be used appropriately to monitor health and safety risks.

Work Package 5: Worker Acceptability & Behaviour

The introduction of wearables in the workplace may be a cause of concern for the workforce. An approach for the evaluation of worker acceptability will be developed through direct employee engagement before and during the device trials. Concerns and challenges will be identified together with potential solutions to minimise them. Evaluation of improved behaviour and compliance will be undertaken after implementation of the wearables.

Deliverable

A guide highlighting common issues experienced surrounding worker acceptance and approaches to enable positive behaviour change through the use of wearables.

Work Package 3: Data Collection & Integration

This work package aims to provide greater clarity around integrating wearables into IT systems. This will review areas of complexity ranging from data compatibility, data volume and data velocity through to system integration and data protection.

Tests and evaluations will be undertaken using suitable wearables selected for use in previous work packages and in line with sponsors' specifications.

Deliverable

A report detailing good practice for integrating wearable devices into IT systems.

The final output will be a good practice guide on the appropriate use of wearables to support continuous improvements in workplace health and safety; this will focus on the two priority areas of MSDs and health exposures

The total funding required for this Shared Research Project is estimated to be £500k depending on the specifics of the programme of work. It is therefore anticipated that with financial support from HSE, each project sponsor would need to contribute £50k. The project is anticipated to commence mid-2019 and take 18 months to complete.

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