



# midas

Meaningful Integration of Data, Analytics and Services

Grant Agreement No. 727721

## Q-Method Evaluation of a European Health Data Analytic End User Framework

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# Consortium Partners

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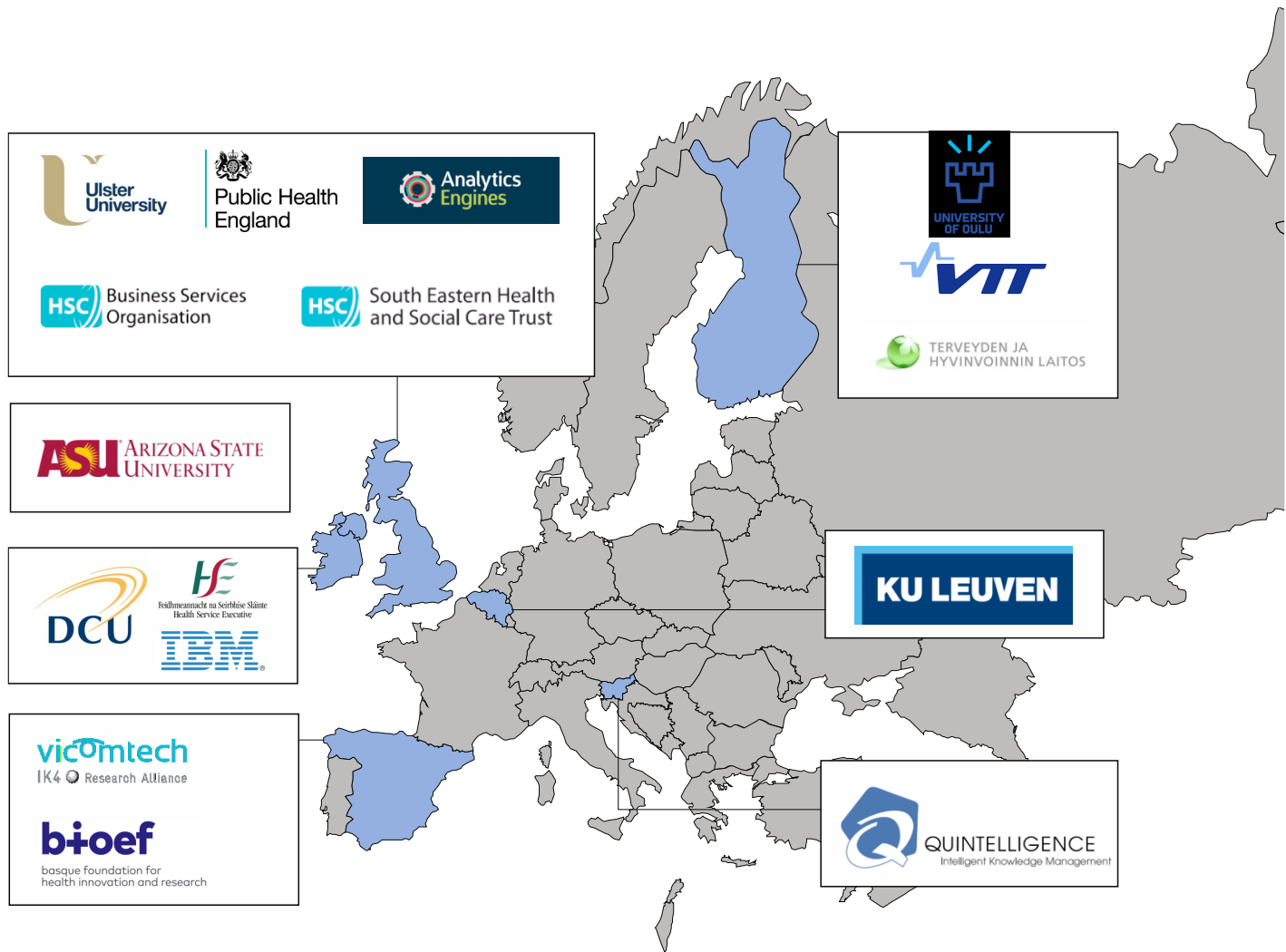
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# Introduction

- The need for effective use of data is particularly critical in public health organizations to support areas such as epidemiologic surveillance, health outcome assessment, program evaluation and performance measurement, public health planning, and policy analysis (Studnicki et al., 2008)
- To take appropriate actions, health policymakers require many different kinds of information
- limited attention is paid to methods of disseminating epidemiological information to policymakers (Zakkar & Sedig, 2017)



- To satisfy this need, more flexible health data representation, analysis, querying and visualization methods (analytic software tools) are desirable (Tilahun et al., 2014)
- End users differ greatly in experience, and professional background, yet visualization tools and other software platforms are designed for a single idealised end user (Ziemkiewicz et al., 2012)
- Critically important to ensure that a thorough evaluation is conducted throughout the development process to minimise the potential for software rejection



# The MIDAS Project

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- MIDAS project funded from the European Union 2020 programme
- The objectives of MIDAS (Meaningful Integration of Data Analytics and Services) is to address the needs of policy makers and citizens across Europe by delivering a unified big data platform
- Achieved through mapping, acquiring, managing, modelling, processes and exploiting existing heterogeneous health care data and other governmental and external open data to enable the creation of evidence-based actionable information
- Inform better long term policy-making decisions and yield a positive impact on point of care health in all policies across Europe at regional, national and European levels



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# The MIDAS Project

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- Work Package 6 - Integration Evaluation and Impact Assessment of the MIDAS Platform Tools
- The main objective is to support the other work packages to maximising their impact on health care, health policy, health and ICT industry, health and research



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# Work Package 6

## Overview Realist Evaluation Methodology

- Multiple mixed-method evaluation framework
- Four case studies, across four regions to facilitate end user involvement in the development and deployment of the MIDAS platform through four case studies
- Case Studies
  - Republic of Ireland (Diabetes)
  - Basque Region (Child Obesity)
  - Finland (Preventative mental health and intoxicant problems of young people)
  - Northern Ireland (Children in care).





# Work Package 6

## Realist Evaluation Methodology

- The key purpose of WP6 is to force serious consideration of the desired MIDAS project results (short-term, mid-term, and long-term, outputs, outcomes, and impacts)
- Longitudinal semi structured interviews performed at critical time points throughout the duration of the project.
- Involves stakeholders (lead technical developers, platform end users and policy makers) utilizing a novel parallel case study design.
- Data collection process developed based - logic model, semi structured interviews and Q sort to evaluate health analytic software acceptance of the MIDAS platform and identification of system requirement gaps at each iteration of the tools development



# Work Package 6

## Realist Evaluation Methodology

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- An iterative series of interviews is undertaken at four critical time points of the projects development with stakeholders (lead ICT developers and policy makers/ end users) of the MIDAS platform
- Participants (N = 16) stakeholders within the MIDAS consortium, lead developers, and policy makers/ end users)
- Parallel interview schedules developed based on the logic model
- Involves engagement between stakeholders driving the MIDAS initiative
  - Technical developers
  - Staff representing policy makers of their respective institutions
  - End-users of the final MIDAS platform
- ICT evaluation process , achieved by continual and accurate assessment based on feedback from lead developers and end-users as related to utility of the platform tools



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## Q Methodology

- The primary benefit of using q-methodology is that it provides a rich and interpretive understanding of the phenomenon of interest, and minimal demands on the sample size (Brown, 1980)
- The application of q-methodology commences with the development of statements which represented the concourse
- Evaluate technical development teams' expectations of the requirements of end users of the MIDAS platform and essential factors for successful delivery of the MIDAS project
- Statements based on project delivery protocol's, a logic model developed in conjunction with the MIDAS consortium, and one to one interview with end users of the MIDAS platform, lead technical developers and policy makers



## Q Methodology

- The primary objective was to identify expectations of the platform tools and its utility for the purpose of assisting effective public health decision making and policy formation
- Interview questions: the big data collection process, barriers to adoption of the project, and discussion of early outputs, outcomes and impacts of the MIDAS project
- Each phase of interviews will inform the next round identifying gaps between end users' expectations of the platform, achievement of the logic model outcomes, impacts



- **Concourse Refinement:**
  - The process of refining the concourse statements involved face and content validation (Valenta et al., 1997)
  - Check items of ambiguity, applicability and completeness within the context of the study
  - On completion of this validation process the number was reduced to (N = 36) statements





- Q Sort Analysis:
  - Factor analysis extractions were obtained through principal components analysis
  - The factor structure was simplified using varimax rotation
  - Composite factor scores for each statement in the Q set were determined from the defining Q sorts for each factor. Prior to factor interpretation (Table 1) and normalized and weighted average statement scores (z score) or factor scores were calculated
  - Statements with a significant factor score ( $p < 0.05$ ) were considered and assessment of the preliminary factor loadings, primary factors were extracted with eigenvalues ( $> 1.00$ ) (Kelly et al., 2016)



# Results

- **Summary:**
  - Each factor represents a viewpoint, held by one or more of the 16 participants, and expressed in their views towards the 36 statements
  - Three separate factors were identified, described as “Technical Optimism” “End User Focus” and “End User Optimism” explaining 47% of the total variance
  - **Technical Optimism (Factor 1)** explained 17% of the total variance for 5 out of 16 participants significantly loaded on this factor:
    - Strong agreement across participants the MIDAS platform will enable end users combine datasets to develop expert knowledge systems and data models (S22)
    - It is essential the platform to generate awareness of the benefits of big data (S28)
    - Technical meetings beneficial for the early identification and provision providing solutions to issues encountered during the early stages of the platform tools development (S04)





# Results

- **Summary:**
  - **End User Focus (Factor 2)** explained 16% of the total variance 4 out of 16 participants significantly loaded on this factor:
    - This perspective strongly endorses: the process of completing legal agreements between stakeholder groups negative impact on the pilot demonstrations progress (S02)
    - Participants strongly endorse: that training workshops should be underway (S06) and the process of resolving governance and consent issues (S01)
    - Participants strongly disagreed: that there are strategies in place to integrate gaps between data sources (S15) as identified in Factor 1
    - The platform will develop indicators (S19) red flags (S21) to identify at risk population groups, provide information (S32) and sufficiently flexible (S14) for policy makers and enhance public health decision making within six months (S20)



- **Summary:**
  - **End User Optimism (Factor 3)** explained 14% of the total variance  
3 out of 16 participants significantly loaded on this factor
    - Participants endorsed effective direction from the policy board as essential to the successful implementation of the platform [S03] more strongly than the other statements
    - Moderately endorsed use the EU Data Portal to harvests the metadata of public sector information [S34] and system dynamics simulations to facilitate improved decision making [S35]
    - Weakly endorsed development of indicators to support effective public health and health policy decision within six months [S19] and utility of the platform tools to provide ‘red flags’ identifying ‘at risk’ population groups to support decision simulations [S21]
    - Strongly reject the process of completing legal agreements slowed progress developing demonstration test platforms [S02] more strongly than factor 1, adhering to data governance, data standards, GDPR [S01].
    - Suggests participants are satisfied with the regulatory environment in which they work. They disagree more strongly than others the platform tools are sufficiently flexible so that both senior policy makers and data analysts can use it effectively [S14].



# Discussion

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- The objective was to explore project progress and the utility of the MIDAS platform tools to meet end user (epidemiologists, policy makers) requirements from the system
- The q sort was performed with these stakeholders a few months before the intended first release of the software being developed
- The principal findings from the first factor (perspective) “Technical optimism” indicated overall participants acknowledge the project is moving in the right direction facilitated through technical meetings and acknowledge the platform tools were in the early stage of development
- The primary findings for Factor 2 - End-user focus (perspective), related to GPDR governance and consent issues negative impact on progress rolling out of the demonstration for each pilot and platform training with end users



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# Discussion

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- The final factor 'end-user optimism' (perspective) as participants expressed positive expectations that the expected data analytic modelling and forecasting utilities of the platform could be used to generate red flags to identify at risk population cohorts from the pilot datasets
- This factor also strongly rejected the statement that GDPR compliance Loading on and ensuring the pilot datasets meet, other data governance criteria impacted on progress to complete the demonstration projects
- Project strengths use of Q methodology, in conjunction with semi structured interviews as a means of studying individual perspectives a systematic and rigorous manner, enabling statements to be quantified statistically using validated research techniques (Kelly et al., 2016)



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# Conclusions

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- As part of this realist evaluation framework of the platform tools development Q-methodology facilitates on understanding the viewpoints of stakeholders focusing on end users' subjective standpoints on issues affecting them
- As the MIDAS platform tools become more advanced further insights will be captured from stakeholders using longitudinal interviews and logic models expected outputs, outcomes and impacts to create additional concourse statements

Further Information

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