

LMI for All careers data tool

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Data development, stakeholder engagement

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Objectives

IDENTIFY robust sources of LMI to inform decisions about learning and work;

COLLATE open data sources in an automated, single, accessible location; Algorithm adjusts aggregation when n would be disclosive or not statistically robust

FACILITATE easy use of LMI data in conjunction with other data, accessible API (simple structures, explorable);

EVALUATE relevance of data tool with key stakeholders

Overview of data sources

Occupation at the heart of the database (4-digit UK SOC2010, 369 Categories); **Sector** (2-digit UK SIC2007, 80 categories); **Area** (12 English regions and 3 nations); **Gender & employment status** (FT, PT, self-employed);

CORE: Employment (time series: historical & projected; future replacement needs); **Pay & Hours** worked.

OTHER: Occupation descriptions (UK ONS); **Skills** data (O*NET); **Change in pay** (2015-2014); **Unemployment** (UK LFS); **Hard to fill** vacancies (UKCES Employer Skills Survey); 2011 Census (occupational employment at detailed geographical level & **travel to work distance**); Occupational destinations of **graduates** (UK HESA)

Big Data: job vacancies (UK DWP Universal Job Match and real-time vacancy data from Burning Glass); UK **Apprenticeship** Frameworks including vacancies.

Estimating weekly pay and hours worked

(Providing detail without being disclosive – simulate)

Data are taken from UK Labour Force Survey (LFS),
Annual Survey of Hours and Earnings (ASHE);

Use of “raw” data from LFS or ASHE is limited due
to sample size and concerns about confidentiality;

Reliance on the “raw” data would result in **huge
gaps** in the information available to be presented;

“Predicted pay” estimates, based on econometric
analysis of ASHE and LFS, with supplementary
equations for details by age, and for quantiles;

Regression of log wage = f (Age, Age², Gender,
Region, Highest QCF level, Industry, Occ,
Gender.Occ, Industry.time, occupation.time).

Data access protocol & format

Use **HTTP** – Protocol of the web, every web browser speaks it;

Use **JSON** – Simple and well-known data structuring format; libraries for processing it are widely available.

Extremely easy to use from inside web apps;

Both **HTTP** and **JSON** are also very easy to use from desktop or mobile app;

A Web example with API explorer on request by SOC

SOC codes: 2431 Architects, 2122 Mechanical Engineers

<http://api.lmiforall.org.uk/api/v1/soc/code/2431>

Response body in JSON gives information on:

Tasks, Job description, Job title, Qualifications, Additional job titles.

Careerometer - free widget

Jobs

Advice

Courses

Info for Schools

Info for Employers

Info for Parents

Jobs

- Apprenticeship vacancies
- Apprenticeship help every Thursday
- About apprenticeships
- Jobs with training
- Other jobs: full-time and part-time
- Local employer websites
- Job of the week
- Applying for jobs
- Finding a job
- Pay
- Volunteering
- Your rights at work
- Job fairs and events
- The labour market

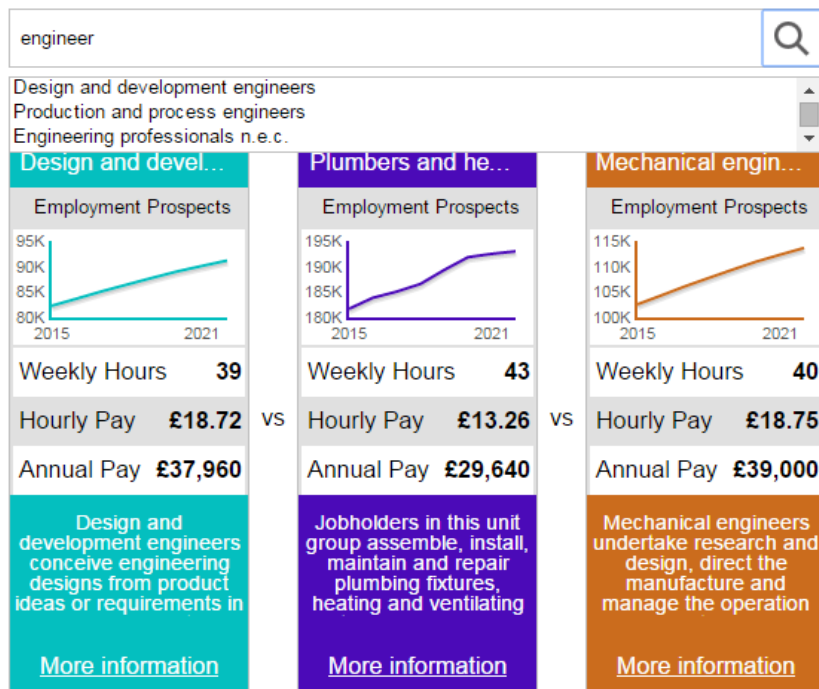
The labour market

Download a **summary of the labour market in Leicester and Leicestershire** employers, skills needed, growth industries.

Careerometer

Enter up to three different careers to compare pay, hours and prospects

Careerometer



Region: East Midlands

Data powered by LMI for All

Icould App

More information about primary and nursery education teaching professionals

Check out **1 video** about this career

Description

Primary (and middle school deemed primary) and nursery education teaching professionals plan, organise and provide instruction to children at all levels up to the age of entry into secondary education.

Qualifications

Entry is with a first degree that provides QTS (qualified teacher status) or, in Scotland, TQ (teaching qualification); or other relevant degree followed by further postgraduate training (most commonly PGCE – Postgraduate Certificate in Secondary Education, or, in Scotland, PGDE – Professional Graduate Diploma in Education). Further and higher professional qualifications are required for some teaching posts.

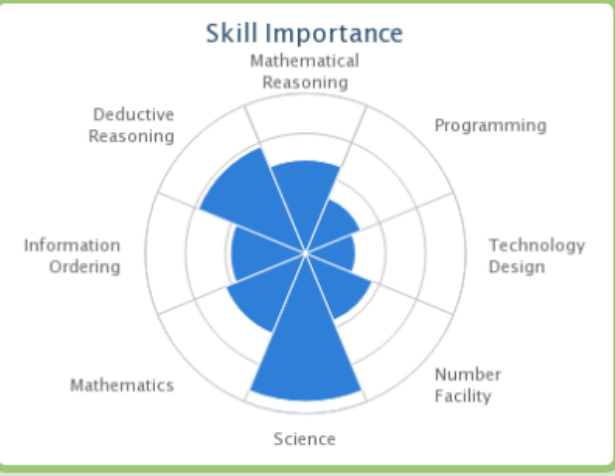
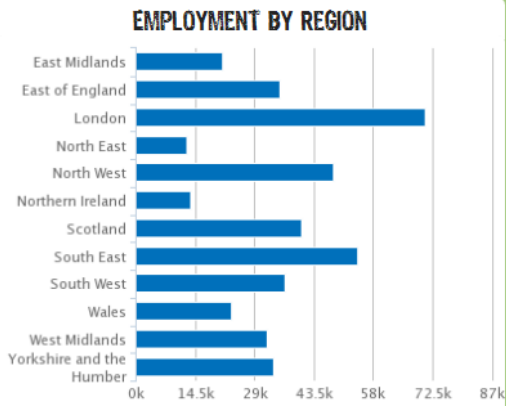
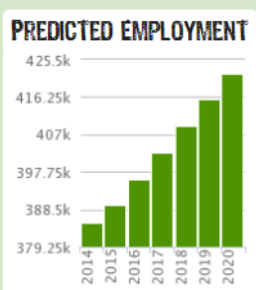
Tasks

Prepares and delivers courses and lessons in accordance with curriculum requirements and teaches a range of subjects



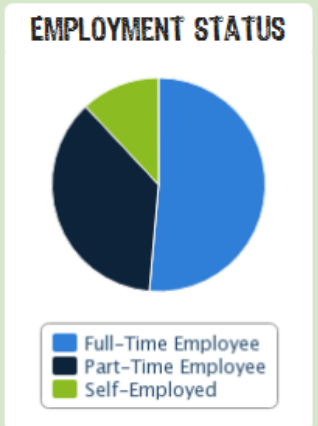
PAST UNEMPLOYMENT

Year	Unemployed
2011	3%
2012	3%



TOP 10 INDUSTRIES FOR THIS JOB

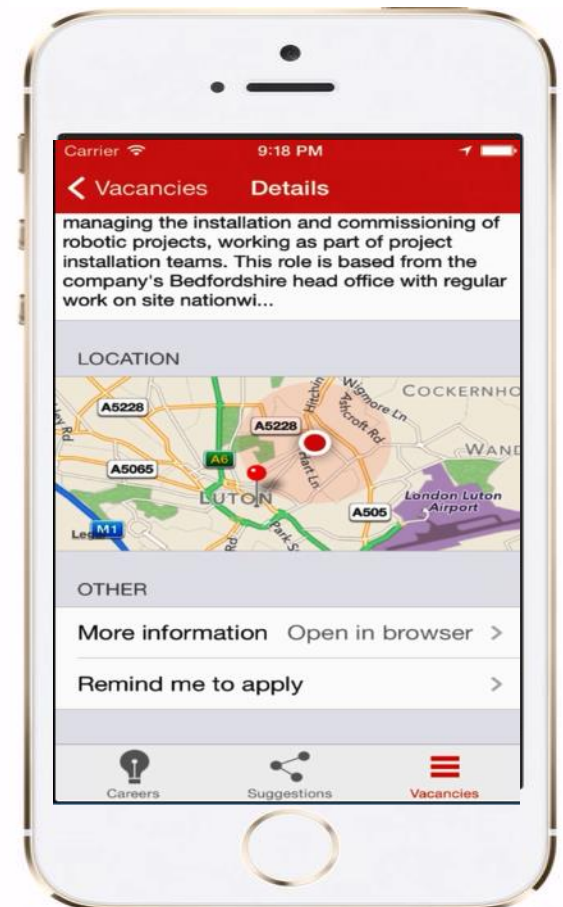
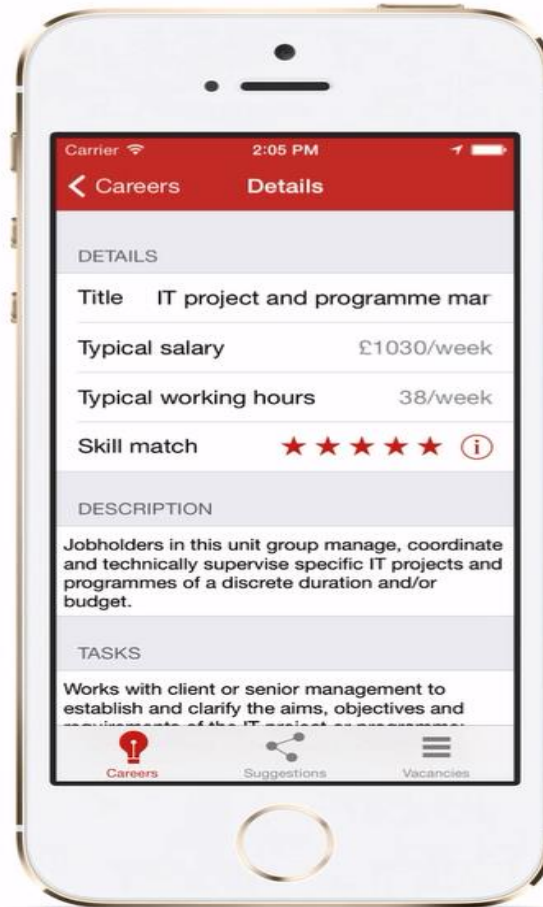
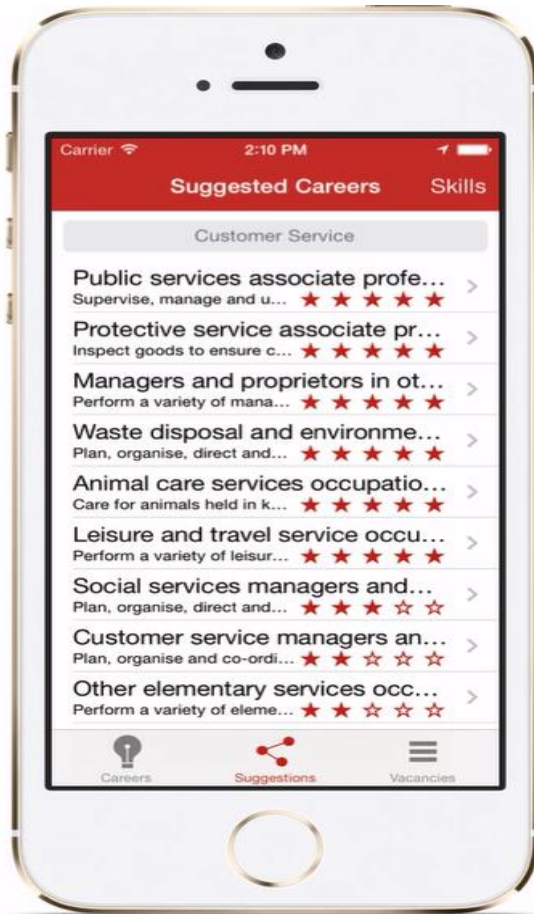
Industry	Jobs
Education	354,038
Public admin. & defence	10,146
Services to buildings	5,646
Employment activities	5,478
Health	4,992
Scientific research	3,567
Food & beverage services	2,832
Other personal service	2,640
Office admin.	2,432
Social work	2,417



JobHappy by 16 year-old Harry Jones



Runner up in the UKCES CareerHack competition, 2014



[Click here for short Youtube video on Job Happy](#)

FIN

Examples of users

Others in progress



ACTIVE
bringing data to life



Skills Funding
Agency



Moving On 

Annex (not covered in talk)

Covering:

- Consultations with data providers;
- Working futures models;
- Checking algorithm;
- data storage;
- Example data extraction;
- Complex Administrative & Big Data.

Need for detailed consultation with data providers and stakeholders

ONS – access to data sets such as ASHE, LFS and the Census of Population and finding ways of publishing detailed estimates;

Statistical agencies in the devolved nations – e.g. regarding the Census of Population in Scotland and Northern Ireland;

BIS, DfE, devolved nation administrations and other bodies – access to data on courses of education and training;

DWP (and possibly Monster) – access to detailed data on vacancies by occupation;

IFF and other data providers – access to source such as ESS to provide detailed 4-digit occupational data on a continuing basis.

Providing detail without being disclosive – Employment

Main official data sources for time series info on employment: Business Register and Employment Survey (BRES), Labour Force Survey (LFS);

Given dimensions (age, gender, location of employment, sector, occupation, qualifications, etc.) one might identify an individual respondent;

Detailed ***estimates*** for employment analogous to those described for pay is much more complex – no simple analogy to the earnings equation;

Use *Working Futures* estimates 1992-2022; complex combination of datasets, including regional Multi-sectoral Dynamic Model of UK economy MDM-E3.

The *Working Futures* models

MACROECONOMY (MDM-E3)

Output and employment by industry; labour supply and unemployment

Employment by Region (12), Gender (2), Status (3),
Industry (UK 87; regions 46; mapped to 75)



OCCUPATIONAL EMPLOYMENT (OCCMOD) and REPLACEMENT DEMAND (REPMOD)

Employment by Industry (75), Region (12), Gender (2), Status (3), Occupation (25) plus
replacement needs



QUALIFICATIONS (Demand and Supply) (QUALMOD)

Labour force and employment by highest qualification held (9)

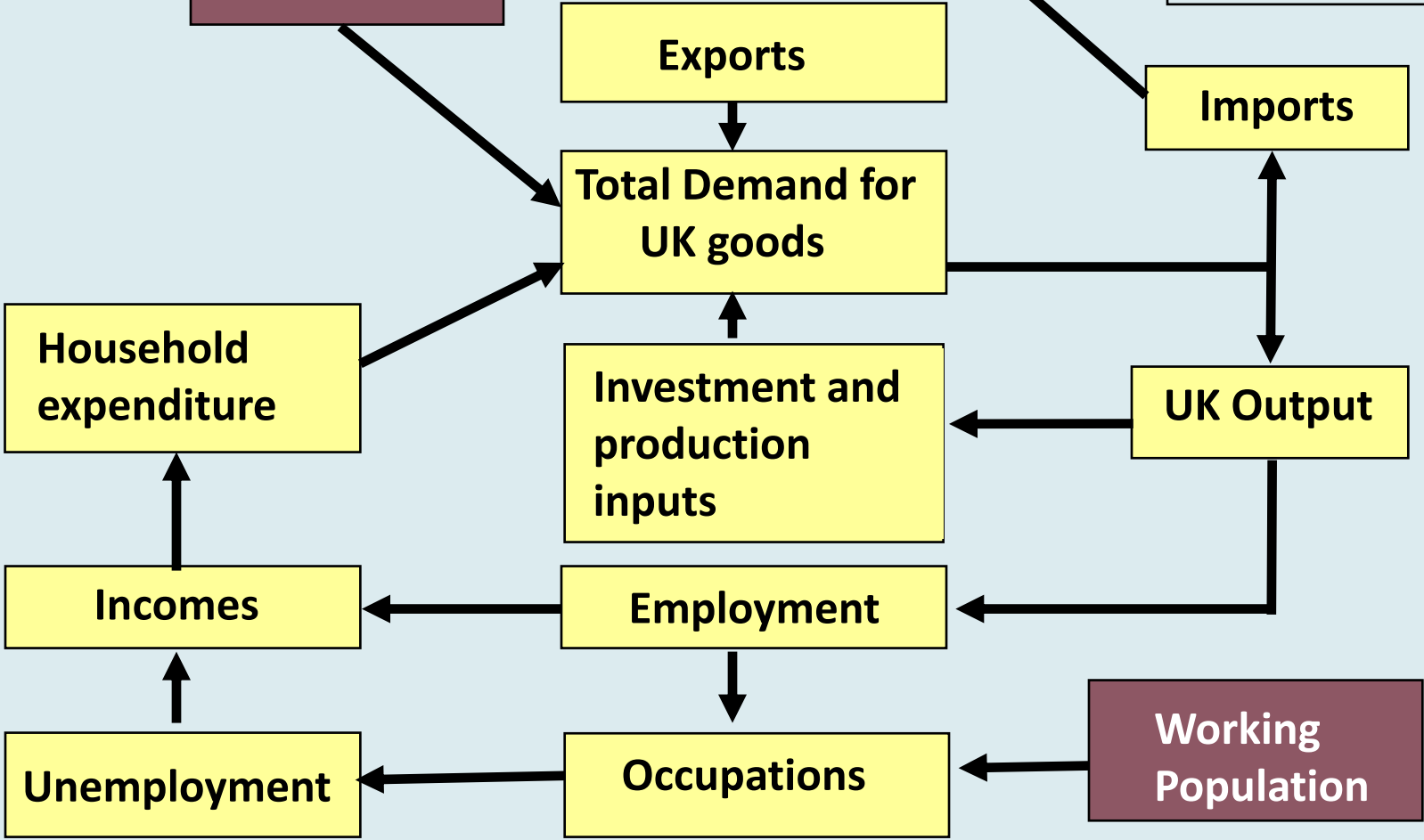
The structure of MDM-E3

World Economic Activity and Prices

Rest of the World

Government

UK Economy



Checking Algorithm to avoid publishing unreliable estimates

Algorithm checks whether n would be likely to be regarded as disclosive or not statistically robust;

Applies to Employment, Replacement Demand calculations, but also for Pay and Hours;

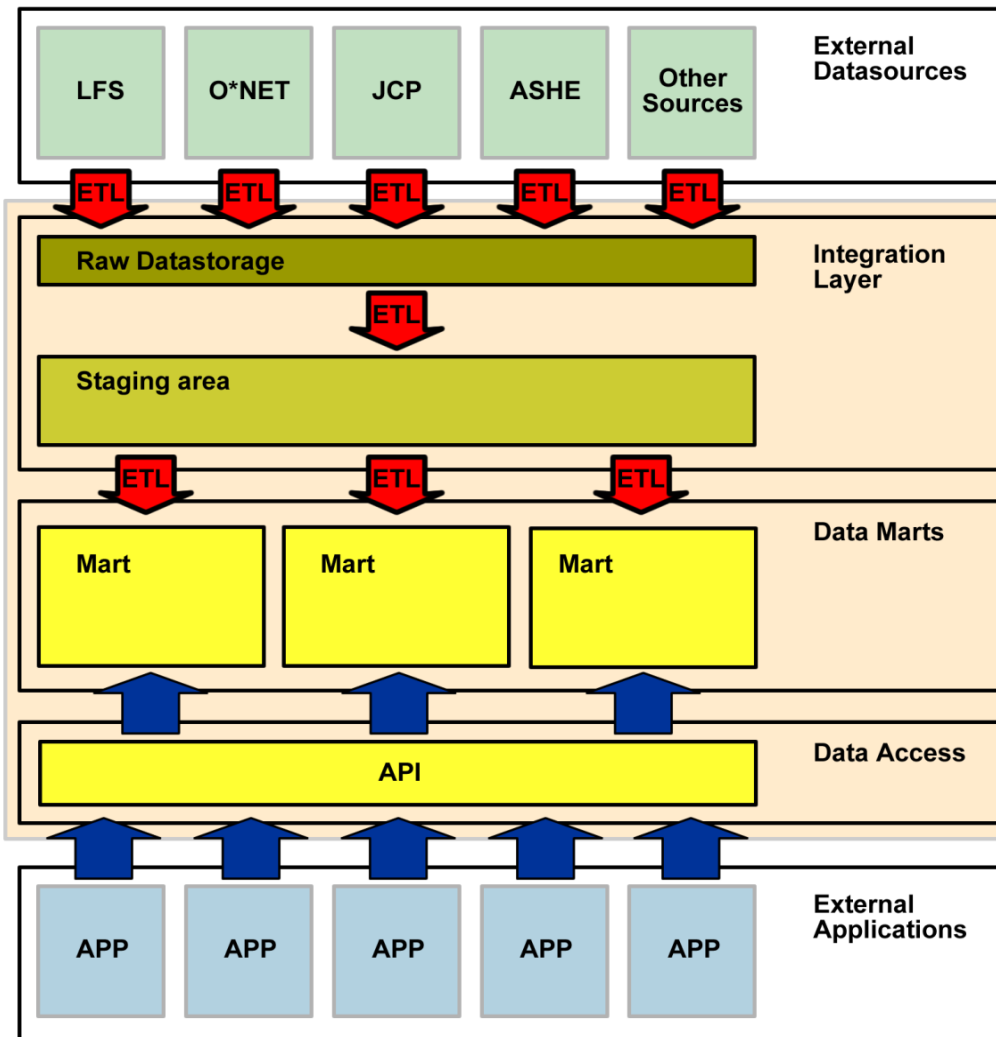
Aggregate 75 industry categories avoids immediate issue of disclosure, ONS agreed reports at this level not disclosive;

If category / cell (defined by the 12 regions, gender, status, occupation, qualification and industry (75 categories)) are below 1,000 return 'no reliable data available';

If category / cell (defined as in 1.) are between 1,000 and 10,000 then query return the value, but flagged to say that this estimate is based on a relatively small sample size;

Offer to go up a level of aggregation across one or more of the main dimensions.

Accessibility & Open Data



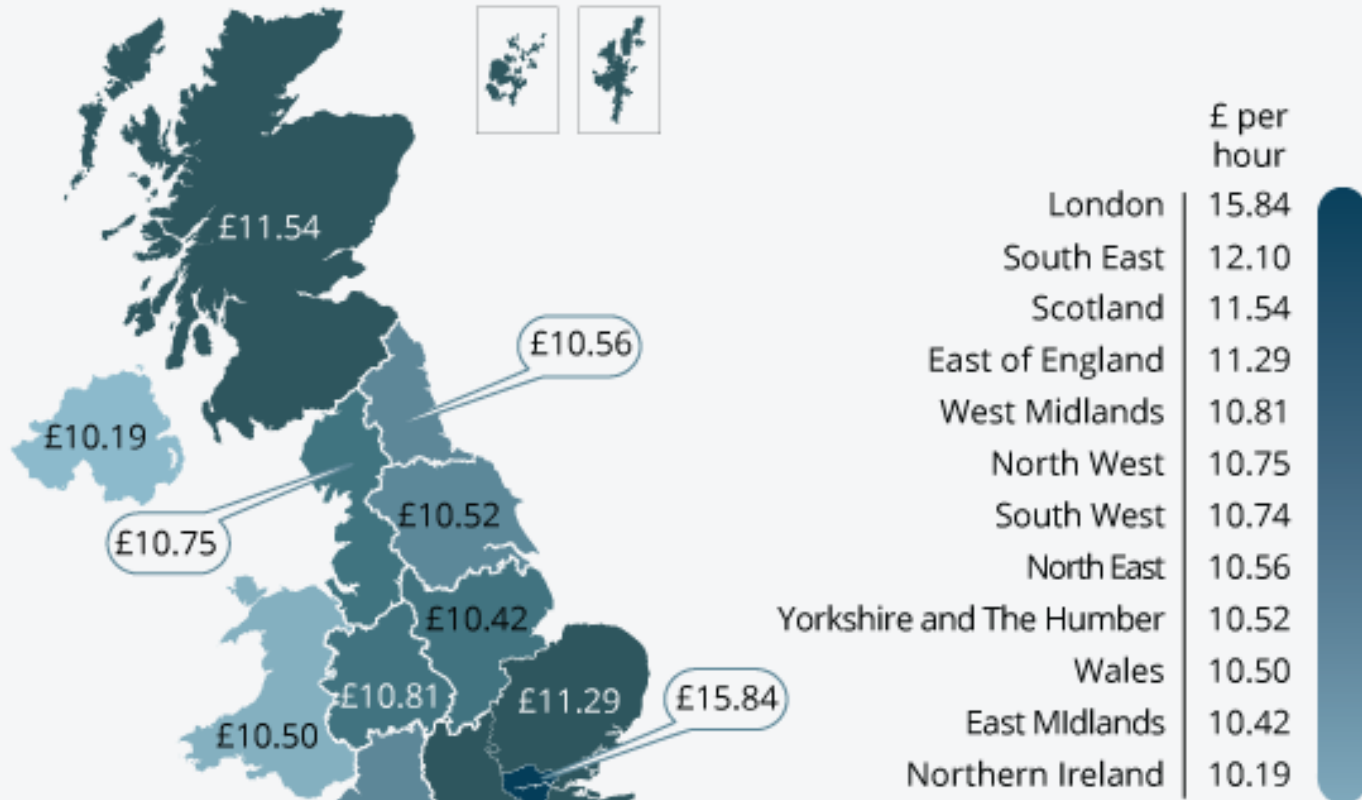
Data Integration

Data Marts

Data Access

Example data extraction

Median Hourly Earnings (excluding overtime) by region and devolved country of the United Kingdom



Applications using LMI forAll:
e.g., icould, RCU websites

Research in Complex Administrative & Big Data for skills analysis and LMI

Real-time labour market information and skill needs

- Gathering real-time data, e.g., Burning Glass, Monster, web-crawling, search engine data, social media, dealing with repeat postings across sites.
- Mapping natural language (across countries) to key categories e.g. job vacancy listings → person/employer/job characteristics

Complex administrative data

- Linking to, open-data, analysing & visualising, **live-updates**

Web-based survey information

- Complement CAPI and CATI with web-based interviews

Modelling and inference issues

- Adjusting for sample composition, bias reduction
- Prediction & uncertainty, computation issues: **concurrency.**