Module Guide

Impact Engineering

Audience: For engineers of all disciplines – whether you're a software or ML engineer, or aiming to "engineer" a successful campaign using tech tools.

"First, solve the problem. Then, write the code." – John Johnson

What? Impact Engineering equips participants with the tools and methodologies to make a meaningful difference. The module combines technical mentoring on using data, AI, and coding as tools for civic impact, with taught content on ways of working to maximise your success.

How? This module is *dynamic*, with content designed in response to your needs and adapting to participant feedback. We won't just be teaching the practice of user research methodology and agile principles, you will experience them directly as we co-create this module.

"85% of data science projects fail to reach production" – Gartner

Why? Effort does not always lead to impact! To make a difference, you must align your technical expertise with the right stakeholders and outcomes. Most digital projects fail, not because of technical capability, but for example 1️⃣ they don't solve the right problem, 2️⃣ poor communications, or 3️⃣ key stakeholders aren't incentivised to care about the project's success.

Technical Topics: The goal is to increase your efficiency and efficacy in taking your vision from idea to code to cloud-hosted reality. Potential topics include:

- 🐍 Modern practices for building AI-powered tools using Python
- 📊 How to query open data APIs, analyse data, and persuade with effective data storytelling
- 🤖 How to accelerate development using AI tooling from Cursor to Claude
- 🚀 Experienced developers will also benefit from more advanced mentoring and project-based learning throughout the module

Non-Technical Topics: We will also be covering the softer side of digital delivery with a learning by doing approach. Potential topics include:

- 🎯 Solve the right problem with user-research techniques
- 🛠️ Design and estimate technical projects
- 🔄 Use agile and Scrum to work iteratively and embrace failure
- 🤝 Manage stakeholders so they won't kill your project
- 📈 Measure what matters and not what's easy
- 🎤 Communicate effectively in writing and in person

Expect a highly interdisciplinary mixture of technical and non-technical. Expect to learn Python to use AI, to use AI to learn Python, and to use agile to learn agile. Expect a truly agile course itself, with user-research workshops adapting the course itself to you...the user.

May your engineering efforts always lead to tangible impact.

Module Leader: John Sandall

John Sandall is the CEO and Principal Data Scientist at Coefficient, where he has worked with 40+ private sector clients, delivered 20+ projects for the UK government, won two £100k+ grants, and delivered 1000+ training courses on using Python for data analytics and machine learning.

Roles / Projects

- **2010:** 10 years' working with youth folk arts non-profit Shooting Roots helping young people to discover their inner creativity and confidence.
- **2017:** Created SixFifty to predict the UK General Election using open data and advanced modelling techniques.
- **2018:** Fellow of Newspeak House interested in open data, AI ethics and promoting diversity in tech.
- **2019:** Co-founded Humble Data to promote diversity in data science through a programme of free bootcamps
- **2020:** Committee Chair for the PyData Global Conference.
- **2022:** Co-organiser of PyData London (Meetup with 14,000+ members and Conference with 800+ attendees).

- **2024:** Working on Fairness Tales to promote our research into hidden biases and create more equity in AI systems.
- **Always:** Violin with Suntrap and curious what the future of AI + music looks like.

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How do I take part in this module?

1. Join the WhatsApp Community 💬

This is not a commitment to participate in the module! We'll have hot tips & tricks, handy resources, who knows maybe some memes. Sign up below, it'll be fun!

👉 **https://chat.whatsapp.com/FuWix2Z0ulx605TZr057B6** 👈

2. Book a Discovery Call with John ☎️

In the 1-to-1 discovery call we'll get to know each other and understand how best to adapt the module to your needs: https://calendly.com/johnsandall/newspeak-fellows

The discovery phase itself comprises the first part of the module. Participants will experience user research first-hand, and receive a behind-the-scenes insight into how the module is designed including templates and guidance on how to conduct their own project's discovery phase.

3. Topics 🧠

The sessions will be catered to participants' needs. See below for a list of potential session topics:

Non-Technical

- **User Research & AI-Driven Ideation:** We will workshop user research exercises with participants' projects/ideas, introduce Scrum practices, and see how AI tools can be leveraged for ideation and research. Participants will learn how to integrate user feedback into development cycles, adapting their approach as needed.

- **Scrum in Action:** Participants will experience Scrum by organising course tasks into sprints, and managing a live backlog in Jira. Learn Scrum through hands-on practice, including running sprints, retrospectives, and managing scope using AI for planning.

- **Stakeholder & Change Management:** Learn why many technical projects fail due to misalignment with stakeholders. Understand stakeholder mapping techniques and incentives to ensure project success. Build strategies to engage the right people and drive adoption, minimising the risk of project failure.

- **Project Planning, Time Estimation & Premature Optimisation:** Fun, interactive workshop on working with AI tools to co-design technical project plans, time estimation techniques for digital projects, avoiding over-engineering, and optimising efforts based on project stages (prototype, alpha, beta).

- **Public Speaking & Technical Presentation:** Participants will learn public speaking techniques with a hands-on session of exercises inspired by actor training workshops, and practice delivering technical presentations. Develop confidence in delivering technical content with clarity and impact.

Technical

- **AI-Powered Python Development:** We will introduce modern Python workflows (collaborative and open-source workflows, dependency management, autolinters/formatters, pre-commit, type hinting), AI coding tools (Cursor/Claude/GPT/Copilot), and handy libraries for fast prototyping and automated data analysis (e.g. Pandas-Profiling). Participants will learn modern Python best practices, how to use AI tools for software development, and understand how to scale Python code for impact.

- **FastAPI & Deploying to Production:** Transition from Jupyter Notebooks to production-ready APIs using FastAPI. Learn the fundamentals of building scalable web apps and services. Gain experience deploying real-world APIs and leveraging cloud services for fast deployment.

- **AI-Powered Data Tools & Visualisation:** Learn to develop interactive dashboards using Streamlit and visualise open-source civic data using Plotly/Seaborn. Deliver impactful visualisations that communicate data insights effectively to non-technical stakeholders.

4. Mini-Projects 🛠️

Project-based learning is at the core of this module, and participants can expect to complete some mini-projects throughout the course, for example:

- **User Research & AI Ideation Tool:** Build a no-code tool that processes user insights and generates project ideas using AI.
- **AI Civic Data Tool:** Create a data-driven tool using AI (e.g. Whisper for speech-to-text) to extract insights from audio feeds.
- **Interactive Dashboard:** Build a Streamlit dashboard to visualise public data in a meaningful and impactful way.

This module aims to enhance your chances of success in future projects. This includes the Newspeak House Prototype module launching in Spring 2025, which should provide a good opportunity for participants to apply everything they've learned in this module. You may adopt agile principles, use our techniques to manage your project from ideation to deployment, incorporate AI or modern data visualisation tooling, and avoid common traps through proactive stakeholder management.

"Absorb what is useful. Discard what is not. Add what is uniquely your own." – Bruce Lee

5. Reading 📚

- **Recommended reading** *(2x copies of both in Newspeak House library)*:
    - *Building High Performance Agile Teams* by Made Tech [PDF download] ➡️ Focus on Ch02 (*Agile Planning*), Ch05 (*Retrospectives*), Ch05 (*Continuous Feedback*) and Ch10 (*Learning From Mistakes*). Other chapters may be of interest if you work in / manage a team.
    - *The Mom Test* by Rob Fitzpatrick ➡️ "How to talk to customers & learn if your business is a good idea when everyone is lying to you".
- **Books I like:**
    - *The Phoenix Project* by Gene Kim, Kevin Behr, George Spafford. If you like this style of learning about "modern"* ways of working through a fictional narrative, there's a follow-up (*The Unicorn Project*), and both were inspired by *The Goal* (** These concepts really aren't new, but they're not yet commonplace in industry let alone third-sector / academia*).
    - *Scrum: The Art of Doing Twice the Work in Half the Time* by Jeff Sutherland ➡️ Agile takes many forms, and how well it works depends on implementation and

culture, but evidence suggests agile projects are "28% more successful than traditional projects". If you want to dive deeper into the *why* behind the *what*, I think this book is excellent and closely aligned with the UK government's best practices for digital project delivery.

- **Other things I like:**
    - *Newsletters:* There's a bit too much happening in AI these days! I use *Bens Bites* and *The Rundown* to stay on top of the latest developments in under 5 minutes per day.
    - *Podcasts:* I listen to far too many podcasts, if you want recommendations, ask me in person. The only recommendation I've had consistent feedback (sometimes years later!) is *Data Skeptic's Mini-Episodes* for learning the basic fundamentals of machine learning through clear explanations between husband and wife over the kitchen table. I've stolen a lot of Kyle's analogies over the years!
    - *YouTube:* If you're already deep into Python and ML, you will learn *so much* more from the PyDataTV channel. These are all recorded talks by practitioners from curated conferences, which guarantees some level of quality and accuracy. My recent favourite is Spacy founder, Ines Montani, with a practical guide to human-in-the-loop LLM distillation.
    - *IRL:* If you have any time outside of Newspeak House events, come to the meetup that I co-organise! PyData London has a monthly meetup in Central London, with a strong community of 14,000+ developers and data scientists. Even better, we're part of an amazing global PyData community spanning 80+ countries that helps raise millions annually to fund open-source projects such as NumPy, Pandas, and Jupyter.

6. Sessions 📅

🚧 Session topics and dates will be confirmed following our discovery one-to-one calls. 🏗️