

Following ^{Digital} Drugs



Digital Drugs: noun, pl.,
 drugs that are dependent on and substantially constituted by multiple digital representations and connections, and whose use and effectiveness is strongly mediated through digital means [1]

Medicines and Drugs are hybrids, part active molecule, part delivery system, part packaging and instructions, and embody protocols of use and afford work practices. They are also becoming in part digital – they are digitizing [2]. Their agency as artefacts (their material agency), in particular their therapeutic potential, draws on digitised data and is applied through digitalised protocols.

From the supply chain, through clinical work and patients' bodies, to post-use data repositories and in structures of regulation, to follow a drug is to tell a story of material artefacts (devices, objects) and of chemical actions in biological milieu. But it is also a story of digital materiality and digital agency.

As a hybrid digital artefact a drug is constituted within, and an expression of, multiple digital representations and inter-connections. From the in-silico science of drug discovery, and testing procedures of randomised control trials, a drug is embodied as digital data.

And the digital sedimentations continue once a drug becomes a licensed product and moves to manufacture and then use. The people and groups who work with and use drugs (e.g. of us) are drawn in to the digital sphere and shape new practices of medicines use, individually and system wide.

In this way digitalization implies new and novel architectures of value creation, realization and capture – new business models. These are expressed in reconfigurations of the socio-technical and economic context of medicines within healthcare; as value propositions, as products and increasingly services, as therapeutic agents, as the locus of innovation and as new forms of regulation.

Following Drugs:

A primary aim of the Delivering Digital Drugs project is to reveal the multiple and interconnected locations and transitions by which drugs become digital.

The research method is to 'follow the drug' and thereby map processes of digitalization and transition that accumulate a drug's digital materiality. Our interest is the drug as (digital) artefact set in the context of its use. We start from the factory where a product is made and follow it into the clinic, into and out of bodies, and onwards as consequence or outcome. As we follow a drug we see digitalization occurring in different settings – what we term 'episodes of digitalization'.

The word episode is chosen to reflect that drugs become digital cumulatively through multiple transitions occurring in different places and times.

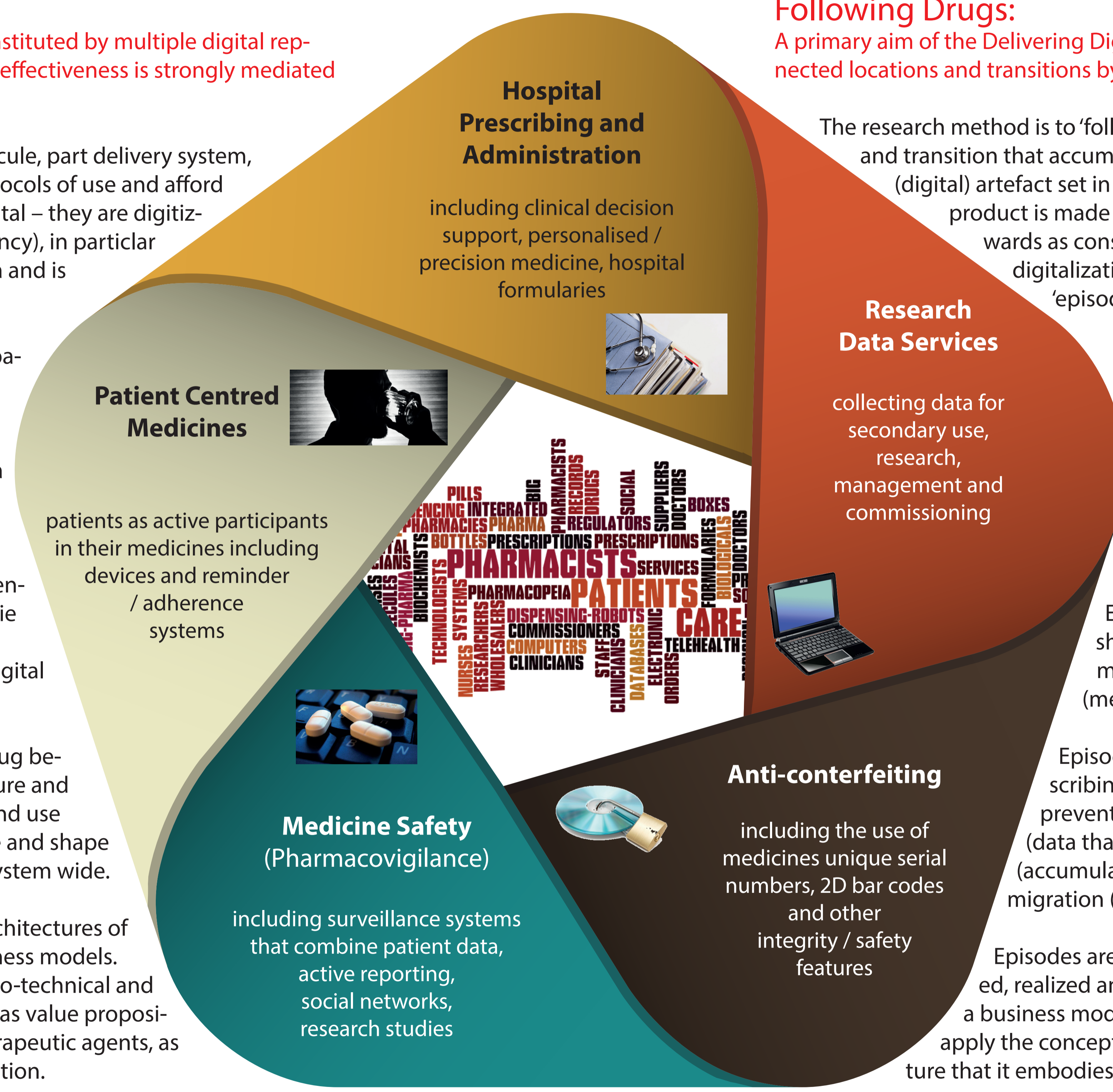
The 5 episodes under study are: anti counterfeiting; hospital prescribing and administration; patient centred medicine; drug safety (pharmacovigilance) and research data service (big data).

Each episode reflects a new entanglement in the relationship between material and virtual aspects and between medicinal product/artefact (drug) and medicinal practice (medicine).

Episodes of digitalization, for example a hospital doctor prescribing using a computer, or a secure bar code being read to prevent counterfeiting, can be described in terms of: digitization (data that moves from analog to digital form), datafication (accumulation of data and its multiple repurposing), and agency migration (agency moving to the digital).

Episodes are situations in which a drug's therapeutic value is generated, realized and captured through digital means. We use the concept of a business model as a way of expressing a value architecture but we apply the concept not to the firm, but to the drug and to the value architecture that it embodies and which is significantly influenced by digitalization.

Thus we seek the healthcare logic of a specific practice, the value proposition it makes and to whom and the mobilization of resources and establishment of processes that it requires [3].



Delivering Digital Drugs (D3)
 is a project funded by Research Councils UK as part of the 'New Economic Models in the Digital Economy' programme.
 RC grant reference EP/L021188/1

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