

28 March 2024

**The Rt. Hon. Gillian Keegan MP**  
Secretary of State for Education

*Seeking to give Users Control of  
trustworthy personal Data online*

cc: see page 4

By email, kindly forwarded by  
**Matt Rodda**, MP for Reading East

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Dear Secretary of State:

**Of paradigm shifts and opportunity costs**

You may just remember that we met over dinner on the evening of 18<sup>th</sup> October. I spoke about the many benefits of new national infrastructure for digital wallets including:

- enabling learners to assemble a true digital portable personal achievement record, to be used lifelong for receiving feedback, micro-credentials, and qualifications from learning providers, to be shown as appropriate when applying for a qualification, or to a new learning provider, or for employment.
- enabling young people – who often lack sufficient conventional evidence of identity (passport, driving licence, credit record) – to assemble digital evidence from learning providers (qualifications, vouches) in support of an application for a secure digital identity, so improving inclusion; and
- enabling learners to give access to their data to an adviser, either human or – at some point in the future – a (well-regulated) Artificial Intelligence, and receive back personal advice, about such matters as career next steps and learning goals.

We call the proposal User Control of Data, or UCD. It relies on a managed market of digital wallets<sup>1</sup>, likely to be provided by the banks, and is no less than a paradigm shift: ‘before’ and ‘after’ diagrams for UK education are provided in Annex A, while a text-based description is given in Annex B. Fortunately, the old and new can coexist for a while, and pilots of the new can take place, at relatively low risk and cost, within a single secondary school, FE college, and university.

I am writing to you from UCDx, a public-interest CIC set up in 2020 with funding from InnovateUK, and a remit to advocate for, and possibly become the future governance body of, the new infrastructure.

On the 18<sup>th</sup> October, you suggested I raise UCD with Russell Viner, the department’s Chief Scientific Adviser. I did so some months ago. In his email reply, provided as Annex C, Russell started well by accepting that “UCD has the potential to bring advancements in data management and personal control over information”. But he then disclaimed any responsibility in the area, and went on to recount the results of discussion with colleagues, in which he was “assured that the right steps are being taken in DfE on digital identity, aligned [with] GDS’s and DSIT’s approaches”. He continued that “we are in the development phase of the work with a focus on understanding how a digital wallet could add value to existing processes” and “colleagues are bound to abide by commercial processes”.

While I am grateful to Russell for taking an interest, I suspect he would agree that his views do not yet reflect the results of a full review into whether DfE’s activities in this area make sense. He has simply

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<sup>1</sup> Wallets can be either based on a personal device, or in the ‘cloud’, each offering a different but complementary application set. DSIT uses the generic term ‘holders’ to refer to both options.

relayed the views of the colleagues who have set the department's current direction. Had he conducted a full review, he would likely have concluded that :

### **1. DSIT and GDS do not yet have a coherent approach to which DfE can be aligned.**

Russell's colleagues state that their approach is aligned with that of DSIT and GDS. This may be the case, but only because - like DfE - neither GDS nor DSIT yet have a coherent approach to rolling out digital wallets across society.

Coherence requires: a multi-application, cross-sectoral approach to wallets, in which there is at least one application capable of reaching critical mass quite quickly; and a credible business and funding model, fair to all. At the moment, three departments – your own, DSIT, and GDS – each hold parts of the puzzle, and the private sector too must play a major role, but no civil servant seems able to glue the parts together to reveal the full picture:

- Your own department recognises that it may need wallet functionality for learner access to, and control of, digital qualifications, and is conducting a bizarre wallet pilot as part of the larger project Titan; more on this below.
- DSIT has responsibility for regulating emerging digital-identity-related infrastructure across society, and has a list of aspirations which require wallet functionality, including repeated-use (of the results of identity proofing), authority management (one person acting on behalf of another), vouching (to increase inclusion), and selective disclosure (for reasons of privacy). While doing the best they can, and hosting a public-private wallet working group with support from GDS, DSIT cannot make much further progress without a route to scale provided by a citizen-facing department with a direct need for wallet functionality.
- And the GDS recognises that it too needs wallet functionality, in order – for example – to enable individuals with a OneLogin identity to collect a 'safe-to-work-with-children' attribute from DBS, and then show the result to potential employers

Were DfE to accept that any wallet emerging from the education sector should also serve the needs of DSIT, GDS, and the private sector, then all might be well. But your civil servants seem determined to follow their own path, neither taking advice nor carrying out any form of consultation. As I indicate below, the result is near certain to be a waste of public money, while incurring a significant opportunity cost, i.e. further delay to infrastructure which is necessary for digitally enabled lifelong education.

### **2. DfE's current wallet pilot is misconceived and cannot succeed.**

Russell's colleagues state that they are still in the "development phase" of their work on wallets and are focused on adding value to "existing processes", presumably the department's centralized qualification database, the Learning Records Service (LRS), long a problem child as described in Annex D. This development phase seems to have no end: in 2019, I briefed senior DfE civil servants about UCD at the instigation of Professor Sir Anthony Finkelstein, then CSA for National Security (and now the Vice Chancellor of City University). And yet DfE has made scant progress in the five years since that briefing. To summarise the key points:

- The idea of wallets and user control is a new paradigm which makes LRS-style centralisation of records unnecessary, save perhaps (i) in anonymised form for statistical analysis; and (ii) in the rare cases of learners who do not obtain a minimum level of qualifications and so need additional state-funded support.
- DfE's current wallet pilot, as part of Project Titan, is also described in Annex D. It cannot succeed. DfE does not appear to have given any thought to the matters of branding, organisational model, funding model, business model or application route map required for its pilot to scale into the kind of multi-application wallets capable of commanding a learner's attention, being used life-long, and integrating properly with emerging plans for national wallet infrastructure – all as being discussed by DSIT's public-private wallet working group.

### 3. There are no insurmountable commercial obstacles

Russell's colleagues also seem concerned that UCD could be incompatible with standard public-sector procurement processes. I suggest in Annex E that this is unlikely to be the case, since UCD can be seen as an update on a distributed payment system, to which the public sector has long procured gateways without difficulty.

Further I also suggest, in the same annex, that the funding model for UCD should take inspiration in part from Open Banking, and in part from the 3G auction in 2000 in which mobile network operators paid for, in effect, the right to continue operating as their underlying technology changed. But this time it will be the banks who will pay, not megabucks as in the 3G auction, and not indirectly via fines from the CMA as for Open Banking, but reasonably to meet their share of the development costs for the new infrastructure. And a mechanism whereby the laggards pay much more should fix the free-rider problem that bedevils infrastructure projects.

The points above indicate that there is something amiss with DfE's thinking about wallets and learner control of data, or at least with the way they tell their story.

To help remedy the problem, might I request you, or a ministerial colleague, find an hour to host a discussion between UCDx, Professor Viner, and any colleagues he might care to invite? As Russell has stated (see Annex C), there is a "need for cooperation and collaboration in the development of digital infrastructure projects like UCD". It may be that a real commitment to such cooperation could be forged around your office table.

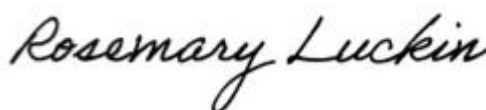
Further, such a discussion can also be seen as preparation for a whole-sector workshop that the Lifelong Education Institute may well soon host in this area. They seem to accept that UCD could become the foundation for the idea of 'Adult Skills Accounts', as well as being relevant to the DfE's Lifelong Learning Entitlement. True infrastructure can support many applications.

I and my colleagues at UCDx look forward to your response. I will invite one colleague, Rose Luckin – who is also professor of learner-centric design at UCL (and an advocate for the greater use of AI in education) – to co-sign this letter with me.

We look forward to your response, and offer our best regards,



**John Harrison** - interim lead Director of UCDx CIC (and director of PIB-d Ltd: a potential development company for UCD; a joint venture with Jisc; twice winner of grants from InnovateUK).



**Rose Luckin** – public interest director of UCDx CIC (and emeritus professor of learner centric design, University College London).

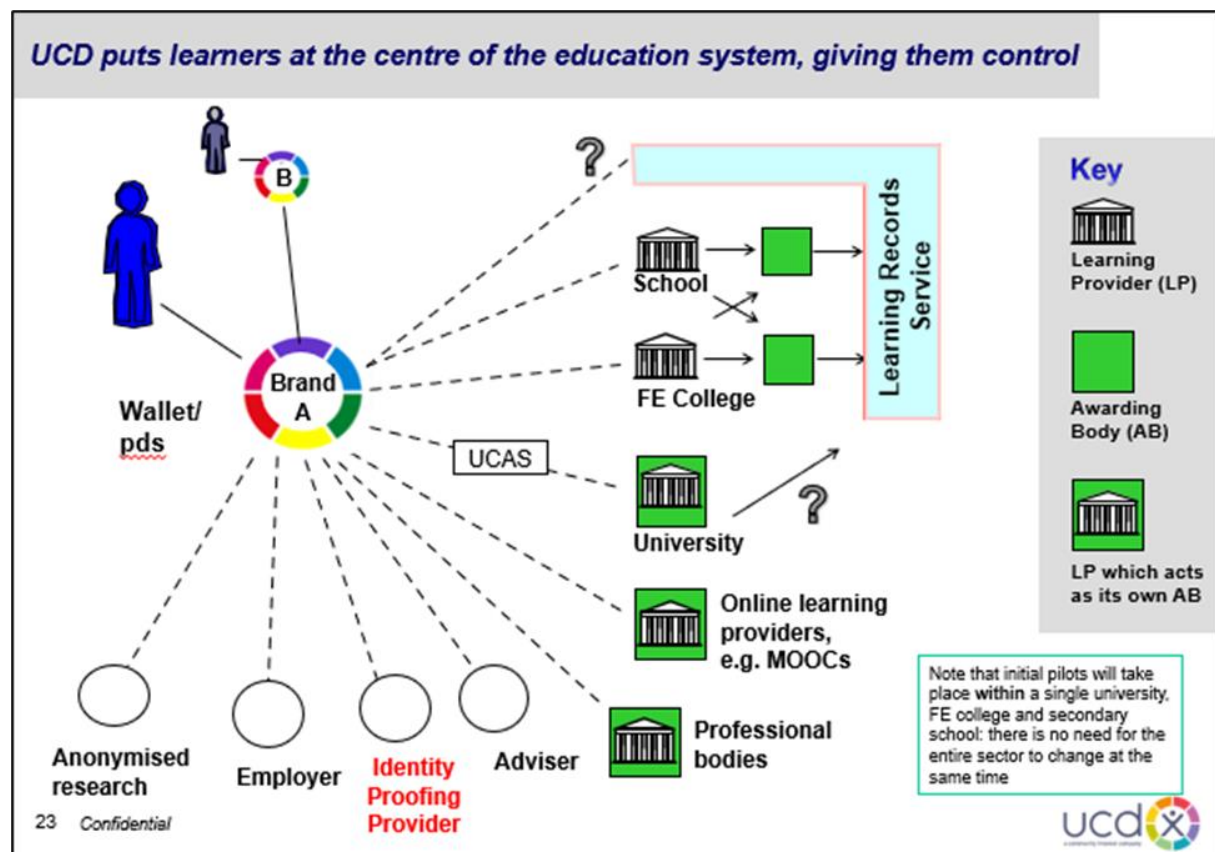
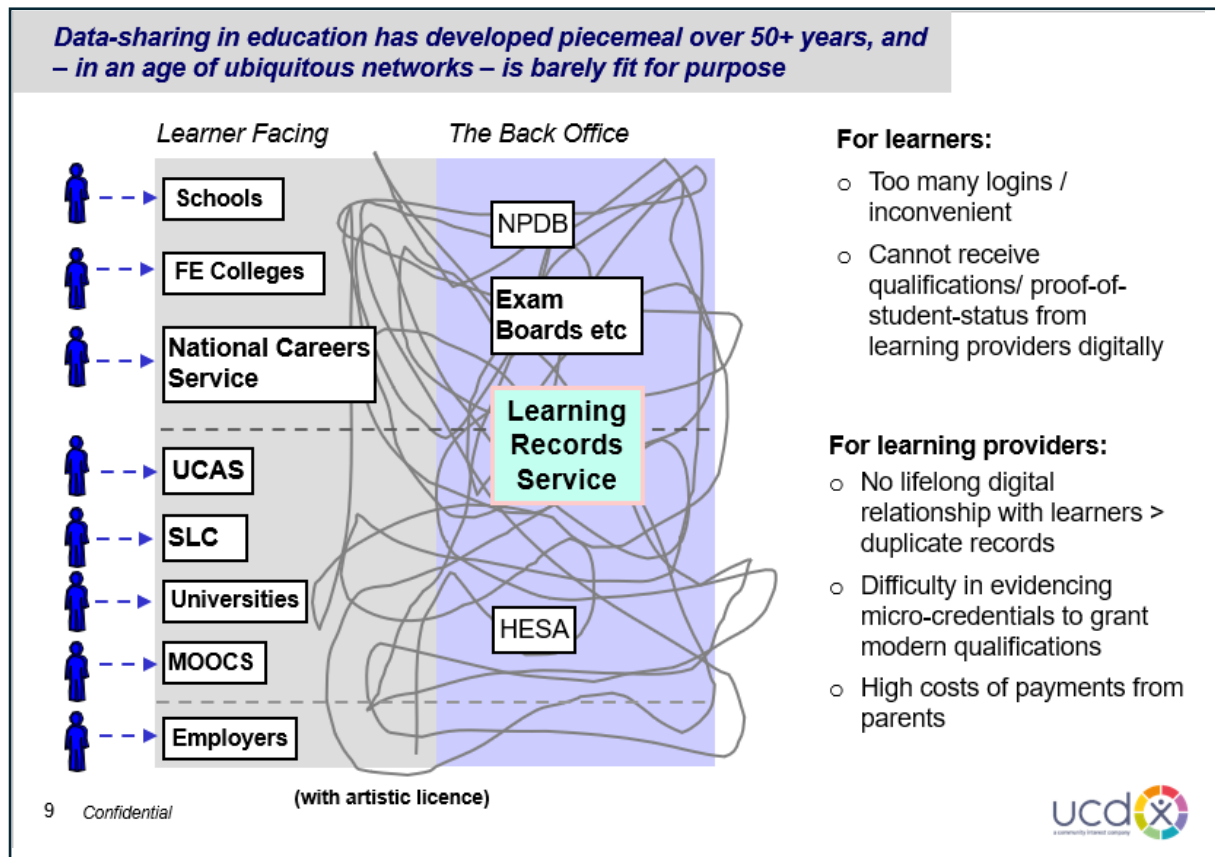
#### Copies to:

Hannah Rutter, digital identity lead, DSIT  
Tom Read, CEO, Government Digital Service  
Nick Mothershaw, Open Identity Exchange  
Dr Marius Ostrowski, Lifelong Education Institute  
Andrew Wood, COO, Jisc

#### Annexes

- A: Schematics of the education sector 'wiring' before and after UCD
- B: UCD in 3 sides of A4 - a semi technical introduction
- C: Email from Prof Russell Viner, dated 18 December 2023
- D: Limitations of the Learning Records Service (LRS), and DfE's wallet pilot
- E: Procuring UCD services; and UCD funding model

Annex A : Education sector digital infrastructure, 'before' and 'after' UCD



## Annex B : UCD on three sides of A4 - a semi-technical overview

Infrastructure for User Control of trustworthy personal Data (UCD) has the potential to replace existing ‘back-office’ approaches to data sharing, fixing issues with online security, identity, agency and privacy.

The UK has the potential to lead in this area. Digital-identity-related infrastructure is now widely recognized to be essential, and the introduction of multi-application digital-wallets is the next big step. While the necessary technical standards are nearing maturity, no country has yet worked out a coherent approach covering the application route map and models for governance, organisation, business, and development funding. UCD fills these gaps.

Note that terminology is still in flux, but the phrase ‘digital wallet’ is used widely, and covers both software on a personal device (a ‘device-based wallet’), and software in the cloud (a ‘cloud-wallet’) – which is sometimes also known as a ‘personal data service’, and will be used by those who do not have a device and/or for synchronisation across devices. DSIT has coined the term ‘holder’ to refer to both device-based and cloud-based wallets. We use the generic term ‘digital wallet’ instead.

**Application route map, and inclusion.** Applications for UCD are legion, and need to be developed in a rational order:

- A true portable personal achievement record (PPAR), to be used by students to receive digital qualifications from their learning providers, and show any selection when applying to new learning provider or for employment
- Proof of legal identity, by sharing data from an identity proofing provider (either OneLogin or commercial) to: (i) an employer for Right to Work purposes; (ii) a landlord for Right to Rent purposes; (iii) a bank when applying for a new account; (iv) the Land Registry for property transactions; etc
- Proof of suitability to work with children and vulnerable adults, by sharing data from the Disclosure and Barring Service
- Authority management (inc. power of attorney), secure communications, & payment.
- Proof of student status for merchant discounts; proof of age for age-restricted purchases; retail loyalty schemes; e-receipts and e-ticketing

The portable-personal-achievement-record application needs to be developed at an early stage, both because it provides necessary functionality for education AND for reasons of inclusion. Many young people cannot obtain secure digital proof of their identity for lack of sufficient conventional evidence (i.e. passport, driving licence, credit record). They will be able to boost their applications by using a wallet to show qualifications (or an identity ‘vouch’) from a recent learning provider to an identity-proofing provider (either OneLogin or commercial) as evidence of the use of a claimed identity in society, all as permitted by relevant government guidance, i.e. GPG45.

Note also that initial pilots of UCD will be small and low risk, taking place within a single university, FE college, and secondary school: there is no need for the entire education sector to change at once/

**Who will provide the wallets ?** The two dominant wallet suppliers, Apple and Google are happy to take easy-pickings from payments, but have shown little willingness to lead development of a proper wallet ecosystem for both payments AND trustworthy data – which requires good governance, a business model covering both types of transactions, and user-friendly features such as wallet portability and interoperability. Thus initial UCD wallet providers are likely to be SMEs certified by DSIT to the UK’s Digital Identity & Attributes Trust Framework; in the longer run, we expect that retail banks will have no choice but to offer wallets in order to remain competitive; Apple & Google will be welcome to join too, provided they accept UK regulation and governance.

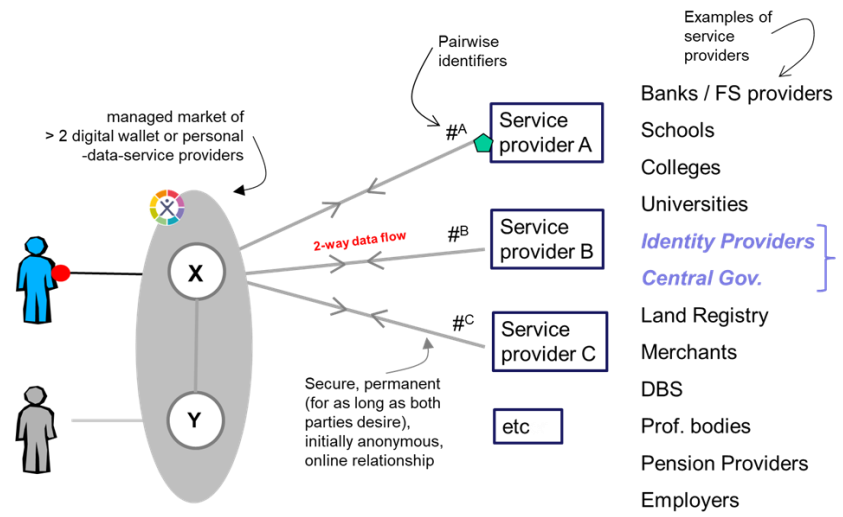
**User experience and interface.** The graphic below shows UCD as it will seem by a typical user. Key points:



i) at the infrastructural level and for privacy reasons, an individual's relationship with each SP is pseudonymous, i.e. the SP knows the user only by a pair-wise identifier (probably realised as a Decentralised Identifier, i.e. a DID)

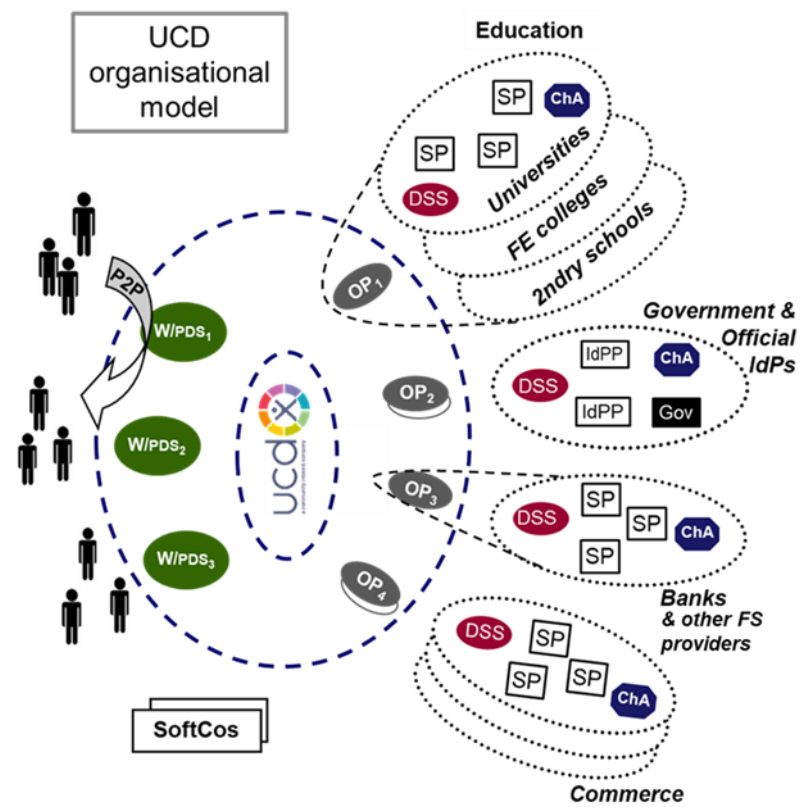
ii) at the UX level, the SP asks the user to release certain personal information - such as name, address, date-of-birth, and qualifications - specifying whether such attributes need to be authoritative or not (note that, on first using a wallet/PDS, the only data available to the user will necessarily be 'self-asserted', i.e. not from an authoritative source, save for preferences.)

iii) the user experience will be akin to that of an SP requesting a payment: the user either complies with the request for data or walks away; indeed UCD can be seen as a payment system updated for the networked age, allowing an individual to (a) release other trustworthy data, as well as money; and (b) to make 'payments' in the context of, or at the same time as creating, a persistent online relationship with a SP.



**Organisational model.** The approach is an evolution of the 4-cornered model used by payment systems. There are 7 roles in the fully developed ecosystem, as shown in the graphic below.

1. Wallet providers compete to equip an individual with a wallet and necessary support. Likely candidates for the role are discussed above.
2. Service Providers (SPs) provide, as the name suggests, services to individuals, and may - in theory - be from any sector. The likely launch sector is education; others include financial services, government and commerce.
3. An Orchestration Provider (OP) acts as a service provider's single point of contact to the ecosystem. The more cohesive sectors, such as Education, may choose in the longer term to provide the function 'in-house'; in others, such as commerce, OPs will likely compete for custom.
4. Characterising Authorities (ChAs) give identity and role certificates (such as 'bank', 'employer', or



‘university’) to service providers. These serve two purposes: (a) they enable individuals to check that an SP is genuine, and relying parties (say an employer) to check that attributes released by an individual (say qualifications) were issued by an organisation entitled to do so; and (b) they assist an individual to select which attributes should be released to a SP (e.g. prescriptions to a pharmacy). Generally ChAs already exist, but are not yet used digitally.

5. UCDx is roughly analogous to VISA for credit cards, save that Visa is fully commercial, whereas UCDx is a community-interest-company, and may well become a charity. UCDx will own the industry co-brand, act as the guardian of technical standards, maintain a reference code-base, and arrange for the sharing of fees and liabilities between OPs and wallet providers.
6. Decision Support Services (DSS) will, in the longer term, help individuals choose between service providers in each sector, and then pass the relationship to the chosen SP. Current examples (in the UK) include USwitch in the energy market, UCAS for entry to university, and confused.com for insurance.
7. Initially wallet providers will develop their own software, to be compliant with the standards maintained by UCDx. But, in time, it is likely that development of wallet/PDS software will be dominated by specialist suppliers, and/or the open-source Open Wallet Foundation.

**Business and funding model.** To meet the costs of conventional payment systems, SPs are charged transaction fees, either a fixed rate (so many pence per transaction), or a small percentage of value (usual for credit transactions). UCD will be paid for either by similar transaction fees, or by a small periodic relationship fee. In either case, the rates will be calculated to save SPs money on their combined bill for trustworthy data, payments, and secure comms. Note that the preferred model for payments will be Open Banking, which is lower cost than cards, and for which UCD is well suited in terms of architecture, providing the missing branding and business model.

Turning now to the funding model, UCDx – as a non-profit – will not seek to raise funds from commercial investors. Instead the company will, at some point, run a competitive procurement to award a concession-type contract to a commercial development company. PIB-d is a potential candidate, since it is the originator of the UCD approach, and will be well prepared, with at least two potential wallet/PDS providers holding equity stakes in the company.

Under the terms of the concession contract, the development company will accrue certain obligations and rights. Starting with the obligations, the company: (i) will - acting on behalf of UCDx - run a working group, advertised through the Open Identity Exchange, to agree necessary standards to make wallets, provided by different parties, interoperable, portable, and suitable for use in education and other sectors, including regulated financial services; (ii) will procure open-source reference software against which different implementations of the standards can be tested; and will issue a public invitation to all potential wallet/PDS providers to participate in the pilots

In return, the development company will enjoy two significant rights. The first is to be the initial OP; and subsequently the OP for all commercial SPs, until such role attracts attention from the Competition and Markets Authority, whereupon the development company will split itself up; this arrangement allows any part of the public-sector (such as education) to set up their own in-house OPs whenever they like, probably as soon as there are signs that UCD will reach ubiquity. The second right enjoyed by the devco will be to charge potential wallet providers - probably the banks - for late entry; this avoids the ‘free-rider’ problem, where organisations delay entry until new infrastructure succeeds; and is fair since the late entrants will have been invited to join the project at the outset and - by delaying - will have avoided the teething costs borne by the pioneers. It’s possible that the development company could even auction off timed entries, say two per year.

**Conclusion.** UCD is a new paradigm in data management, with the potential to become ubiquitous digital infrastructure for the UK, fixing problems with access to personal data, privacy and control of use. But implementation is a large task, requiring collaboration across public and private sectors.

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**Annex C : E-mail from Professor Russell Viner, CSA at DfE, dated 18 December 2023**

----- Forwarded Message -----

From "VINER, Russell" <[Russell.VINER@education.gov.uk](mailto:Russell.VINER@education.gov.uk)>  
To "John Harrison | UCdx" <[john.harrison@ucdx.org.uk](mailto:john.harrison@ucdx.org.uk)>  
Cc "ERDELMANN, Julia" <[Julia.ERDELMANN@education.gov.uk](mailto:Julia.ERDELMANN@education.gov.uk)>  
Date 18/12/2023 15:47:40  
Subject User Control of Data -

Dear John,

I hope this message finds you well. Thank you for your detailed and informative email outlining the User Control of Data (UCD) proposal and its potential applications in various sectors, including education.

I appreciate the effort and time you have put into presenting this initiative and your previous attempts to engage with the DfE on this matter. It's evident that UCD has the potential to bring advancements in data management and personal control over information.

As the CSA for DfE I certainly have an interest issues relating to technology, but I do not have any responsibility over digital and technology business areas. However I have discussed with colleagues and am reassured that that the right steps are being taken in DfE on digital identity, aligned GDS and DSIT's approaches. We are in the development phase of the work with a focus on understanding how a digital wallet could add value to existing processes, and have not made any final decisions on what a product would look like. As I'm sure you are aware, colleagues are bound to abide by commercial processes.

I understand the need for cooperation and collaboration in the development of digital infrastructure projects like UCD, and I will discuss with my colleagues whether there is any scope for further cross-government working, including joining the wallet/PDS working group you mentioned.

I appreciate your dedication to this initiative and would like to thank you for considering my input.

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**Annex D : Limitations of the Learning Records Service (LRS), and DfE's wallet pilot.**

In 2007 the Department for Education commissioned the Learning Records Service (LRS), a scheme in which every learner would be allocated a Unique Learner Number (ULN), to be used to aggregate qualification data via back-office data sharing and so create an 'Personal Learning Record (PLR)' in a central database.

At present some 146 awarding bodies contribute data to LRS. Qualifications captured are generally those regulated by Ofqual such as 'A levels, GCSEs, BTEC, Diplomas and Functional Skills', although any not funded by the Education and Skills Funding Agency may be missed. Further, some 8120 learning providers can access the data online, and do so to check what they are told orally, or on paper or via web forms, by learners.

Learners themselves cannot access their own PLR online. DfE has tried to give them access, but has found that – because the data has been removed from its original context (i.e. the relationship between the learner and the learning provider) – it is often not possible to identify a learner remotely to a level of confidence high enough for the purpose.

Further, any hopes that DfE may have had of using the Government Digital Service's OneLogin Service (a combined single-sign-on and identity proofing utility) to fix this identification problem have come to naught, for the same reasons that frustrated its own efforts: many people, especially the young, simply do not have enough conventional identity evidence (passport, driving licence, credit record) to obtain a secure digital identity, regardless of which organisation attempts to act as the identity proofing provider.

DfE's latest attempt to give learners online access to their PLRs is part of the much larger Project Titan, and is based on Microsoft's open-source digital wallet software. According to replies to a number of FOI requests, their idea is that some learners at secondary school will be persuaded to use the software to 'carry' qualifications from LRS to an FE college as their next learning provider. There are several problems with this idea:

- as indicated by the name, a digital wallet is intended to be a personal thing, used by an individual to sign on to multiple distinct organisations and control the sharing of credentials – such as qualifications – between them; and
- DfE's wallet scheme appears to be focussed on the technology; there is no evidence of thought about the necessary organisational, governance, business and funding models required to scale the initial pilot (enabling learners to carry qualifications from secondary school to FE) into multi-application wallet infrastructure, of the kind required to capture an individual's attention and be used lifelong.

Further:

- it is not clear why DfE's wallet pilot proposes to source qualification data from the Learning Records Service, rather than from the Management Information System of the secondary school where the learner studied; one possibility is an attempt to justify the continued existence of LRS as a centralised database.
- the only tidy way to fix the LRS learner identification problem described above would be to have the secondary school issue a Unique Learner Number as a credential to a learner's wallet; the learner could then show the ULN to LRS in order to gain access to their PLR; but if the school issues a ULN as credential, then why should it not also issue qualifications directly ?
- Microsoft states that it has no plans to introduce a consumer digital wallet, and – by implication – that its wallet software is not designed for this purpose.
- DfE has stated that it has neither conducted any public consultations about its wallet proposals, nor taken any advice from identity experts, save for one exception - where the CEO of the firm concerned has commented that their proposal 'makes no sense'.

All told, it does seem that, in pursuing their work on a wallet scheme associated with LRS, civil servants are - in the words of Russell Viner – “focusing on understanding how a digital wallet could add value to [their] *existing processes*”.

Put otherwise, DfE’s current approach is organisation-centric, where the department is the organisation, and it desires to protect the LRS database, and perhaps gather better statistics, despite:

- A conflict with the spirit, if not the letter, of the data protection legislation, since – given the existence of alternative privacy-friendly approaches (such as UCD) - the data gathered is excessive compared with the uncertain benefits; and
- The significant opportunity cost in not supporting a UCD-type approach, and thus not helping improve the experience of learners as they engage with a multiplicity of different learning providers lifelong, funded from a variety of sources (not just DfE), and receiving digital feedback and results direct from the learning providers in a trustworthy form – which they can also show to others.

DfE has known about UCD formally since a meeting in 2019, attended by the Chief Data Officer and the Chief Scientific Adviser (Russell Viner’s predecessor). As far as we can tell, and despite spending some £4.7 M of public money on its bizarre wallet pilots, it has made zero useful progress since that meeting.

It is time for change.

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## Annex E : Procuring UCD services; and UCD funding model

Russell Viner indicated that his colleagues were also concerned that UCD would be incompatible with the standard public-sector procurement processes. This seems unlikely since UCD can be seen as an update on a distributed payment system; and the public sector has long procured gateways to such systems without difficulty.

Further:

- DfE will not necessarily be the procuring body. It is the learning providers – schools, colleges and universities - who will purchase UCD services, and they will only do so if satisfied that they will get value for money, probably by entering into a single contract for a combination of payment (if any is required) and trustworthy data services.
- There is provision in UCDx's plans for Jisc to act – should it wish to do so – as a hub for bulk purchase of payment and data services on behalf of the entire education sector, much as it does for other shared services, so avoiding reliance on any single commercial entity and achieving economies of scale.
- DfE could also purchase wallet services from the UCD infrastructure, enabling learners to access their data as held on the Learning Records Service. While this might be a useful interim measure, it would serve little purpose longer-term since learners would already have copies of their qualification data in their wallets, taken directly from their learning providers' Management Information Systems.

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Turning now to the funding model for UCD, the proposal is not a standard internet start-up of the kind that can be funded by venture capitalists. Rather, we believe that there are three relevant precedents:

1. The creation of credit card networks, such as Mastercard and Visa, in the 1960s, both formed by consortia of banks chasing profits from the new idea of credit cards and realising that few single banks could create, or managing, a credible network by themselves.
2. The way in which the UK Government auctioned the licences required for 3G mobile telephony in 2000, effectively forcing the existing mobile networks (and one new entrant) to pay a grand total of £22.5 billion to remain in (or enter) the industry as the technology changed; and
3. The UK's Open Banking programme, in which the Competition and Markets Authority fined the 9 largest UK retail banks for lack of innovation, using the proceeds to fund the non-profit Open Banking Implementation Entity.

As always, no precedent is an exact fit. The UK banks show no inclination to work together to create a wallet infrastructure, as happened for credit cards, because there is no evidence that doing so will be profitable (although it may be), and they tend only to innovate when forced to do so. And anyway, a wallet proposal which was commercial from top-to-bottom might well encounter difficulty since sensitive personal data is involved, creating a need for public-interest governance.

The 3G auction showed how large incumbents will pay to remain in business when technology changes. But that case was simpler than for wallets, since (i) most all the technical development work had already been completed, funded largely by the EU; and (ii) governments had something tangible to sell, i.e. permission to use the spectrum allocated for 3G.

Which brings us to wallets. The UCD approach is similar to the 3G auction in that the technology is changing; but it is dissimilar in that the incumbents – in this case the retail banks – neither want to change, nor accept the inevitability of the change. Instead change often has to be forced upon them. This was demonstrated in 2016 when the Competition and Markets Authority fined the nine largest retail banks, essentially for a lack of innovation, and used the proceeds to pay for the Open Banking programme - which developed digital infrastructure to allow start-ups, once commissioned by an individual, to access the individual's transaction data as held by retail banks.

While Open Banking has been a success, it can be argued that the reform did not go far enough and – even though implemented by the banks – was never really supported by them for lack of any long-term effect on either their revenues or costs, or on their competitive positioning in the retail market.

Seen in this light, UCD can be regarded as the next necessary phase of Open Banking reform, one that will enable individuals to set up an account with a new bank with little more than a single click, manage accounts from multiple providers through a single interface, and pay for goods and service using Open-Banking style direct-to-bank payment mechanism, so circumventing the card networks.

Rather than having the CMA force the banks to change again, UCD offers a more subtle and market-led approach: the carrot rather than the stick. The education sector, with the portable personal achievement record as the lead application, offers a good route to scale for new wallet infrastructure – which can also be used for identity and banking applications. If DfE and UCDx, both public-interest organisations, collaborate to develop the new infrastructure, relying initially on SMEs as wallet providers (all suitably regulated by DSIT), then - as scale is achieved - it is near certain that one of the nimbler banks will spot a marketing opportunity and enter the wallet market. Other banks will then follow, not because they see a way of making more money, but rather because they need to offer up-to-date technology to attract custom, particularly from young learners who will become their wealthy customers of the future.

And so patterns begin to repeat: all of a sudden the banks need to offer wallets to remain competitive, and – like the mobile network operators before them – will be willing to pay fees to be allowed to do so. Only this time, payment will not be made to government for a spectrum licence, but rather for membership to the wallet scheme that has won a concession contract from UCDx, as the governance body, to develop and pilot the necessary trust framework (and open-source wallet software). There might even be a bidding process, with whichever bank paying most being offered first choice of date of entry into the wallet market.

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