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Fit-for-Future Land Administration: Sustainable Transformation

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Executive summary

Land Administration is no longer immune from the inevitable progress of change and citizen expectations and the Land Authority must enable and support the new normal of “change as usual”. Traditional approaches of big-bang solution delivery are failing to keep pace. Data volumes are ever increasing, and considerable time effort and cost is spent on migrating information to the next “new system”. However, it is also true that a large proportion of land information changes infrequently – many titles/parcels will not materially change across the lifetime of one or more systems. This paper presents an alternative approach of accepting change and variability in data as part of enabling sustainable fit-for-future solutions.

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Introduction

A Changing World and its Impact on the Land Authority

There is a growing imperative for the land authority to recognise its role within a world that is facing change at an ever-increasing pace. This is underpinned by three key areas of change that we categorise as follows:

Megatrends

Factors such as the digital transformation, growing urbanisation, increasing globalisation, and the impact of climate change all affect the way that land is used, owned and lived on. These factors challenge the land authorities – in terms of organisation, technology, data etc. to remain relevant and trustworthy.

User Expectations

User expectations are driven by the elegant experience they have when interacting with platforms such as Facebook and Twitter, and the transparency, ease and speed that platforms such as Amazon provide for the carrying out of transactions. Users expect clear and transparent access to data, and the ability to make decisions for themselves.

Growth Aspirations

In creating economic growth and providing security for citizens, governments are looking to support more complex decision making processes, utilise new technologies such as AI and BIM, and to link up the key datasets that are used to manage a country – citizens, companies, addresses and so on. Governments expect their land authorities to provide better and more efficient land markets – creating more inclusive and widespread registration of tenure to support both citizen aspirations to borrow against property as part of innovating new businesses and growing the economy, and to support more effective and clearer taxation. Governments further frequently hope that these improved land markets will encourage and support foreign investment and increased market liquidity.

Avoiding Change

Traditionally we have seen a tendency in land authorities to avoid change, particularly in the technology space, constraining what new services they are able to offer. Systems have grown organically over long periods of time, with system update only taking place when the imperative to change has become so strong that it can no longer be resisted. System life-cycles of fifteen or twenty years are not uncommon.

This should not be a surprise: the traditional approach to change in order to support new services or government requirements is one of high risk, high cost projects that prior to delivering any business value involve long implementation cycles and massive data transformation activities before a huge big-bang upgrade takes place.

The failure rate of these projects is unacceptably high: total failure not uncommon and partial failure or limited business value delivery is almost par for the course. Even the successful projects can be seen as moving the land authority from one fixed state to another, and often to a fixed state that is obsolete almost before it goes live.

Taking a Fundamentally Different Approach

We propose a new approach to this problem, where rather than trying to avoid change, the support of change is regarded as not only inevitable, but a valuable and necessary thing that should be enabled – not constrained.

We see this as a critical shift in mindset: as the need to support the changing needs of government and of citizens becomes ever stronger, the land authority should consider enabling of new services and supporting of new data structures something that is “business as usual” not a large high-risk project that is to be feared and avoided for as long as possible. We have coined the term “change as usual” to reflect this.

Taking this viewpoint suggests a fundamental shift in thinking around land administration technology – requiring that support for change has to be architected in right from the start. This viewpoint also suggests that the approach to data transformation that typically takes place as part of support change also need to change.

This latter point necessitates the capability to support change in the data model easily, and without requiring that all data is transformed into the new model as a pre-requisite for implementing the data model change. Old data models must co-exist with new and newer ones, with transformation to the newer model taking place on an opportunistic basis rather than a systematic one.

Furthermore, even once transformed, the old data versions making up the history of a title, in their original data model, provide useful evidence to support such things as investigations into registration issues.

Transform as Needed

We propose that the right paradigm for enabling “change as usual” is to directly support the co-existence of multiple versions of data models within the technology platform, and to shift from an “en masse transformation” approach to a “transform as needed” approach.

Requiring transformation of data from an old model to the new one as part of delivering that new model should not be a pre-requisite and is not desirable when the aim is to support the rapid pace of change we now see in the world.

The “transformation as needed” approach is one where the transformation activity takes place on an opportunistic basis, at a point where the registration is being modified for some reason – the clearest example being when a dealing takes place that involves transfer of a title. This represents an ideal time to bring the record up to date with the latest data model, where it can remain until the next time an opportunity to update it takes place.

This approach sits nicely alongside some kind of systemic transformation, but means that effort can be focussed on the value-producing activities of the land authority in handling dealings and other transactions rather than being buried by the problems of mass data transformation.

Case Study - How Many Records Actually Need Transforming?

In this paper, our thesis is that en masse transformation of data from one data model to another should not be necessary, and is not desirable as part of supporting the aim of enabling support for “change as usual”.

A further component to this argument is that the en masse transformation of data is also wasted effort as a substantial number of records will not be transacted within the lifetime of a technology system – and so transforming their data brings no value – the data won't be used in its new state. In fact, given the aspiration to support “change as usual”, the data may be transformed several times before it is actually used.

To support this hypothesis, we wished to generate a reasonable estimate of the percentage of records that a land authority holds that will be transacted on within a given timeframe. This number would provide an evidenced view of the value (or lack thereof) of carrying out mass transformation of data from one data model to another.

In order to generate this estimate, we present here some analysis based on data from the England and Wales Land Authority: Her Majesty's Land Registry (HMLR).

HMLR publish a large and valuable dataset known as the Price Paid Data. This contains within it the overwhelming majority of residential property sales that have taken place within England and Wales since 1995. Some residential property transactions are omitted from this dataset – they are:

- Sales that have not been lodged with HM Land Registry
- Sales that were not for value
- Transfers, conveyances, assignments or leases at a premium with nominal rent, which are:
 - 'Right to buy' sales at a discount
 - Subject to an existing mortgage
 - To effect the sale of a share in a property, for example, a transfer between parties on divorce
 - By way of a gift
 - Under a compulsory purchase order
 - Under a court order
 - To Trustees appointed under Deed of appointment
- Vesting Deeds Transmissions or Assents of more than one property

(HMLR 2020)

We have made the following assumptions about the data:

- We have uplifted the number of transactions by 10% to account for property transactions that are excluded from the Price Paid Data, and to cover other transaction types (such as addition or removal of a mortgage) that may require data

transformation. This adjusts towards to the worst case (least supportive of our hypothesis).

- We have assumed that 92% of residential properties are registered with HMLR. Again, this adjustment is towards the worst case, least supportive of our hypothesis. Sparkes 2019 states that "98-99%" of residential properties are registered, so the figure of 92% is a very conservative number.

Using data from the Office of National Statistics, we have used a figure of 21.6M residential properties in England and Wales. Coupled with our second assumption above, that suggests HMLR have a portfolio of just under 20M titles.

Even having made these adjustments towards a worst-case analysis, we find that against that portfolio, only 40% of the titles were transacted on during a ten-year period.

The full results are as follows in Table 1:

Proportion of the residential property titles transacted on in the last...				
Number of years:	20	15	10	5
Number of titles transacted:	13,864,737	11,085,864	7,988,572	4,956,234
%age of total titles:	70%	56%	40%	25%

Residential property titles: 19,872,000 (estimated)

Table 1 – Proportion of residential titles transacted on for multiple time periods

This suggests strongly that an “en masse” data transformation exercise – taking all current data from an older data model to a new one – will transform data that will never be transacted on by the new system, simply to be migrated yet again in a later system refresh. This is especially true where more frequent data model change is implemented – assuming a change even every five years (a lifetime in digital transformation terms), a mere 25% of titles would have transacted between data model changes.

Future analysis would be valuable on the types of property that transact frequently – for example, it is expected that small homes in an urban area would be likely to be starter homes, and to transact frequently, but the evidence for this has not yet been generated. This would allow the targeting of systematic data transformation at the titles that are expected to transact “soon”, leaving behind those that typically have a long life before transacting and needing bringing into line with the latest data model.

Solution Design

The support for the co-existence of multiple data models within the same system is not well aligned to the use of a traditional relational database, where the data model is fixed at the point of realisation in the database. Newer database technologies – particularly document-based NoSQL databases – seem much better aligned, supporting arbitrary data models, while still presenting familiar SQL style interfaces as well as capabilities relating to search, query, update and so on.

We suggest that a future technology platform that wishes to enable change will be one that moves away from a fixed data model realised in a relational database, and will move to well controlled schemas for different data entities, where the schema can be up-versioned over time without requiring transformation of data that is in an older version of the schema.

Such a solution would present a “sliding window” of schema versions – with the “oldest” data in the system – the data transacted on the longest time ago – being in an old schema, and with data that has been transacted on more recently in new versions of the schema. This will present some challenges in managing how the older schemas are accessed, but we suggest that an approach of “data in old schemas are read only” with “transform as needed” used to bring data into the latest schema if it needs to be written to.

In the Arab region, increasing urbanisation and rapidly growing economies brings with it a need to support new kinds of land tenure and the need to support 3D and 4D cadastres. We are working with one of the most innovative GCC countries, which due to Non-disclosure agreements we cannot state here. The country is changing their approach to how they think about cadastre; becoming forward thinking because of productivity gains; and understanding the importance of using technology to change data models as conditions change.

Business Value Early, Change Delivered Frequently

Within this paper we will close with the perspective of business value. Business value is not generated by changing underlying technology per se; it is generated when new capabilities are enabled. The delivery of a new technology platform brings with it new capabilities (else, why upgrade?), but those capabilities only deliver value when they are actually live.

By taking an approach of “transform as needed” the painful data migration task from old system (be it electronic or paper) can be constrained to the minimum possible transformation necessary – the new technology platform should recognise and implement the old platform’s data models (there may be more than one). This enables value from the new system to be delivered much earlier in the development cycle.

We propose the shift in mindset to one of “change as usual” where the support of change to deliver new value is something that is a natural part of day to day operation of the technology: where again the delivery of new capability and the underlying data model

changes necessary to support it are achieved without mass data transformation – or indeed any data transformation until it is needed to support a particular transaction.

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