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# Ofgem Call for Input on the Future of Distributed Flexibility

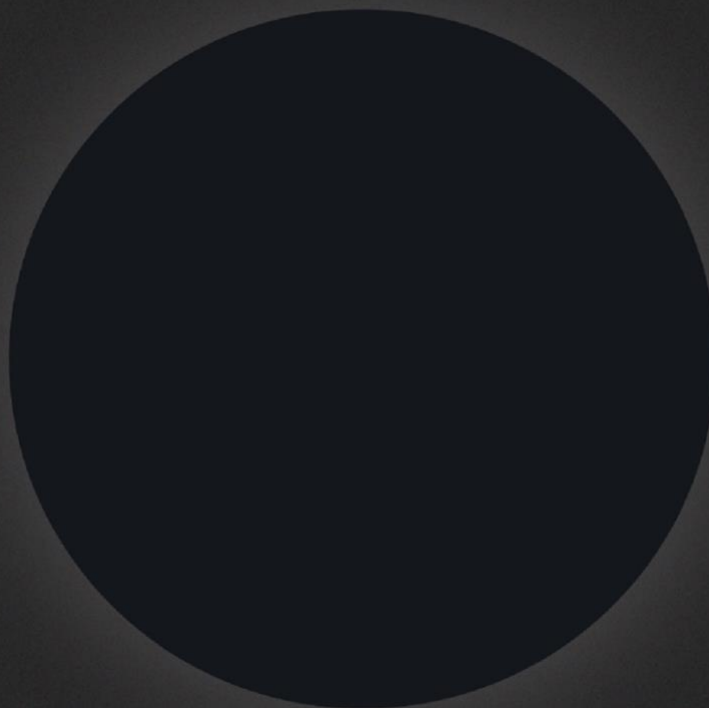
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From Ofgem Call for Input on the Future of Distributed Flexibility2023.pdf  
6.4 Appendix 4: Call for Input questions

**Section 1**

**1. What do you think distributed flexibility could contribute to the energy system?**

There are some truths that are apparent right now. The net zero clean power system target for 2035 is under threat. There is greater need for flexibility right now than the industry is able to deliver. We need lower bills, reduced strain on the grid, better energy security and better visibility of the facts in order to be more agile and respond faster to these truths. It's easier said than done. This is also a hard truth. If it was easy, we would have achieved it by now. It is difficult, it is necessary and we need to reform to deliver on 2035. Therefore we feel the case for reform is self-evident, let's get on with discussing what change we can manifest now.

So we have established that more flexibility is needed. Indeed 20 to 30 GW more flexibility by 2035 is no small task. No one entity can deliver on that. Even if more than one stakeholder is involved (ESO and respective DSO's to name but two) which they are already then by definition that debate of should flexibility be distributed or central is already over and that boat has sailed. Let's get on with discussing how we can accelerate distributed flexibility and what that can contribute. We believe that increased regional flexibility provision benefits should be lower bills, reduced strain on the grid, lower cost to serve and better energy security.

Lower bills should result from maximum generation of power in the home or SME site, maximum usage of that power on-site to reduce the overall need to feed power in to the site, the maximum application of insulation and other technologies to reduce wastage of that energy and the maximum convenient stable sharing of excess power to the regional grid. We believe these elements are amongst the most critical when looking through the lens of the home or SME business towards Consumer Energy Resource flexibility. DSO's also have a part to play in lower bills to the consumer, more regional flexibility mechanisms should be sought to maximise the in-feed of renewables and storage to the regional grid not just for stability but for provision of lower cost services. Retailers together with Financial Institutions also have key roles to play to aggregate new regional data to fast-track the provision of new bundled funded convenient services that are easily accessible to a consumer. One can imagine a retailer selling the overall CER package of enhanced insulation, enhanced heat provision, enhanced storage and enhanced tariffs to minimise the overall bill to the consumer, reduce the strain on the grid, lower cost to serve and enhance regional energy security.

With homes and regional SME businesses participating in flexibility mechanisms their data can be shared to DNO's / DSO's and to Energy Retailers that can properly reflect the regional flexibility provision benefits by enabling lower tariffs in reflection of less net electricity usage, increased grid support and higher energy security that they provide. More data also means easier and quicker identification of those stakeholders that need support, and without that support, they would not be able to participate in regional flexibility provision benefits. On the other end of the scale those that choose not to participate simply do not have access to those regional flexibility provision benefits and would

hence pay a premium for that choice of non-participation.

Distribution System Operators need to be in-control of what is happening in their regional areas, and need to play the part of digital enabler / digital owner of that process, not necessarily the 'digital do-ers' of absolutely every piece of the flexibility process. Grid stability will be an increasing challenge as we approach net zero even at the LV level and will need massively increased monitoring and data sharing between stakeholders in order to come to an overall solution. Smart meter data, electric vehicle charging data and smart home data needs to be fully shared with the DNO / DSO and not aggregated to the level of uselessness. With that data comes great responsibility to anonymise and properly protect personally identifiable information but we all now have access to the tools that can do that without losing the usefulness of that data to inform a plethora of processes, models and visualisations that are crying out for this enhanced visibility.

We suggest that this data could be shared with Retailers appropriately to inform better more accurate regional tariffs. With this increased visibility of data, we believe much more accurate simulations, load forecasts, problem identification could be done to speed up adoption of flexibility without the negative trade-offs of reducing grid stability and/or reducing energy security. With this increased capability we believe that cost to serve can at least be kept level or in a best case be reduced towards 2035.

OFGEM also needs more visibility into how DSO's are doing in enabling that increase of flexibility in their regions. The current method of sharing of data and visualisation of that data between OFGEM and the DNO's / DSO's is not fit for purpose and needs radical change in all aspects; velocity, volume and veracity. We should be able to do a much better job of sharing that regional data driven by increased distributed flexibility to drive a new level of 'control tower' information that can drive much more granular and relevant decision support tooling on data-driven scenarios for OFGEM. We believe that a common spine, a common flex exchange, common automatic asset registration and common connections process can drive benefits harder and provide OFGEM with much more granular, reliable and relevant information to ensure increased liquidity in flex markets, increased situational awareness into problem areas so that appropriate scenario modelling can take place with real data to inform policy decisions.

In summary, distributed flexibility seems to be THE part of the energy system that we need to accelerate the hardest in order to unlock numerous other regional flexibility provision benefits.

## 2. Will a focus on CER flexibility also help enable other forms of flexibility, especially distributed flexibility?

Consumer Energy Resource flexibility is absolutely necessary to deliver lower bills, reduced strain on the grid, lower cost to serve and better energy security. With that said we have to admit that it will also add a next-level order of magnitude of complexity to both DNO / DSO's and Retailers.

We think it will enable other forms of flexibility by allowing the DSO's to optimise within the Grid Supply Point and within secondary subs areas within the GSP. By reducing the needs for many GSP's to be heavily 'supported' from outside, DSO's will be able to optimise provision for lower cost, lower grid



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strain and higher energy security rather than spend time and resource on critical 'support' operations for those GSP's which face critical issues, which we believe they face due to lack of overall visibility of all stakeholders data within the GSP. Imagine a case where all electric vehicle data, all smart meter data (un-aggregated) and smart home data together with a Unified Network Model on the DNO side of asset data (asset data that is geospatial and stateful) feeding the Active Network Management balancing data for the whole GSP. There would be little you could not visualise, infer and/or simulate with access to an Ontology like that.

## Section 2

### 3. Is there a 'case for change' and a need for a common vision for distributed flexibility?

As stated we believe the 'case for change' is self-evident. The net zero clean power system target for 2035 is not on track and increased distributed flexibility is needed.

What is not self-evident is that we need a common vision for distributed flexibility at the highest level, in the sense that if stakeholders are taking action that achieves lower bills, reduced strain on the grid, lower cost to serve and better energy security then they should do it. There is always a but. The but is, what happens when certain actions are conflicting with other benefit objectives? For instance, reduced strain on the grid is delivered with an order of magnitude more cost that becomes unacceptable.

Where we see this practically is in the application of an agile approach with standards;

- standardised ontology holding together the standardised relationships between objects and their actions in order to 'define once and re-use many times by many stakeholders'
  - this must be where we get to, so that all stakeholders are using the same data model that's standardised, and are not prevented from translating what they already have into that model, rather than starting from scratch
  - standardised ruleset allows system wide changes in workflows and processes. With an Ontology the rules and actions can also be standardised as well as the objects so that they all can be re-used and built-on in the nodes for agility that's needed at the edge, or 'node'
- standardised data model, e.g. in asset data we would describe with CIM. An Ontology can use a standard for objects, actions and relationships, AND can also have a CIM layer through which assets, grouping of assets or topologies can be shared amongst appropriate parties
- standardised control pane that monitors 'collisions' of benefits with a process behind it that stakeholders can refer decisions to, to get a holistic picture of the answer of why a decision has been taken. The record of why the decision was taken in such a way will be incredibly helpful in the future when that decision might be overturned in a good way, for example a number of individual applications might be declined until a larger project or a larger 'bundle' gets approved and then the individual projects can get approved. The communication of the reason for the decision, the decision itself, and the assumptions behind the decision are really important, and multiple parties viewing that decision support criteria is also important in order to speed 'bundles' of decisions through faster where an individual decision might be declined.

Stakeholders can focus on the building and optimisation of processes and value rather than building yet another tool that is not standardised, connected or able to be collaborated on.

We also don't think the waterfall method of building the standard before any work is done is the right way, as we know from experience that even large programs can have their rulesets changed and moulded throughout time without de-railing anything. We can't afford as an industry to spend years building yet another standard and not get started iterating our way to a better application of flexibility.

Therefore we see the need for a common vision but also the need for some common infrastructure, collaborative action now with standards built-in to enable iterative governance.

We will right here take great pains to emphasize that we believe in distributed control, distributed agility, distributed opportunity to innovate and lead. We believe in a standards based way to do that. We believe that a central nerve should run through the spine to enable least-cost to get to v1, least-cost development, least-cost management post-build, least-cost change amounts and it also minimises the time spent to get going. These three points are massive and are where a huge amount of money is normally wasted in large IT projects.

We believe that in order to maximise a level playing field, to maximise visibility for OFGEM, ESO, DNOs, DSOs that you have to have a minimal spine that is able to report on the actual going's on of how much flex is happening where and why, in order to incentivise learnings for other areas and regions. This will benefit not just OFGEM but those regional 'nodes' where the DNO, DSO and ESO will interact with FSP's and other important stakeholders to deliver on regional flexibility. We believe strongly that the way to best develop flex is in regions that are logical groupings.

#### 4. What is your vision for how to accelerate the delivery of accessible, coordinated and trusted markets for distributed flexibility?

We believe that an accessible market means one that has an open automated asset registration process and a semi-automated discovery process to tell people exactly where and when their asset could be connected, how much they could expect from various options. We believe that AI has an important role to play in adding flexibility service providers register their assets in an appropriate way to help the DNOs properly, automate the own processes to ensure governance takes place and flexibility service providers get in as accurate answer as possible.

We believe that a coordinated market means having a centralised underline control plane understands both the happy path and not so happy path. The happy path means one where reporting on which markets is working well, the constituent parts of that market and an overview of the volume, velocity and veracity of the transactions that make up the market is such that stakeholders like OFGEM, DNOs, DSOs all understand explicitly what is working well and can share in that knowledge to bring up those regions where it is not working so well. A multi-faceted league table is a great idea to incentivise performance. The not so happy path is also valid, understanding the constituent parts and how they are not performing, how to resolve things like conflicts and decision criteria, conflicts between node, regions, assets, non-performance, under or over supply to a particular market, because of third-party conditions, such as extreme or sustained weather patterns or extreme climate event.

We believe that a trusted market means standardising the nature of the decision-making basis, making open the logic of the decision-making across the system. Speed and simplicity are often factors that are not focused on, we believe them to be crucial to a trusted system.

Hopefully in our comments under each of these facets for markets of distributed flexibility with shown how they could be accelerated by delivery of these elements.

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**5. Will certainty of an end vision help accelerate enabling work and make it cohesive?**

Certainty of an end vision is never 100%. Therefore we believe that if the destination is not completely fixed, people should understand the direction of traffic, the rules that apply and therefore they can plan accordingly. We feel that we are behind the timeline already, and the comfort of the false certainty of an end vision is like a crutch. People will find an excuse to not start if that vision is all-encompassing. We would never argue against people wanting the certainty of that end vision it is not a bad thing, but we would not want to be stopped from starting the journey before that process is complete. We believe that people do understand the direction of traffic and the rules, and we should be allowed to start the journey. We believe that iterative experience is more valuable than planning meetings and needs to be biased towards rather than planning being the bias.

**6. When should a common digital energy infrastructure be in place? And therefore, when should development begin?**

We all agree more common digital energy infrastructure is needed than less right now. We find the discussion about “right” dates, particularly unhelpful it takes time away from starting and iterating right now.

### Section 3

#### 7. What should a common energy digital infrastructure look like, and why? Please consider the archetypes or develop your own proposition.

We believe in the vision put out by OFGEM through a variety of papers. One of those being developed by the Digital Spine working group calls for a data sharing fabric or 'data mesh' which is a foundational concept in Palantir Foundry data ecosystems. The ecosystems already deployed at places like Airbus, already show that 120 organisations (some in cut-throat competition) are very happy at sharing not only data, but a common Ontology of objects, relationships and actions BECAUSE it is the least cost, least risk, most cost-effective way to start developing your own blocks on top of a foundational layer. BECAUSE it doesn't actually cede any control over the data model (org's can add on top of the standard), the Ontology (org's can add whatever they want) and that foundational functionality is available immediately; such as security, robustness, completeness of toolset and scalability.

Is more than 30 PB of data, over more than 6000 object types, with more than 5 million parameters. Indexed is already in production, and we should seek learnings from other industries to show how we can do this effectively without reinventing the wheel; which normally comes with increased costs, increased risk and increased time spent.

Our comments about the **Thin Archetype** will be short. It leaves out too much capability from the scope, there's no auditable record of offers, contracts or performance that will be key to monitoring the flex market, building trust in the flex market, avoiding conflicts, identifying gaming behaviours, or other potential frauds, and determining the success or otherwise of the markets, and the players within. Key to our criticism of this archetype is that we don't understand how you would share learnings between Flex markets, this we feel is absolutely critical to success. It also introduces the maximum time into the equation by everybody having to build their own unique interpretation of flex, there would be no standards, no data sharing and a lot of failures, unnecessarily. So for the reasons of too much time, too much risk and too much cost and not enough benefit we must avoid this archetype.

**Medium Archetype.** There are a number of parallel platforms that mirror this archetype in other commercial spheres. Shipley is one of these and it works well as it is a transparent system that enables trust to be built between suppliers and buyers based on the feedback from previous transactions. EBay works in a similar way. As stated in section one of the request documentation, this archetype brings a large set of advantages to the flexibility market that the thin archetype will not provide. We are in agreement with these advantages and believe that our offering can meet this need.

From our viewpoint this system is all about distributed control, not about true distributed systems that have much more overhead (time, cost and risk) because of the need to architect all the underlying infrastructure, standards and processes instead of using that time, energy and money to build on top of a common foundation. Distributed systems bring too much complexity in terms of managing data consistency and ensuring that platform upgrades are distributed and installed successfully without compromising system performance. The reason that a modern data ecosystem like Airbus's Skywise platform work so well is that they are systems accessible from anywhere, highly secure, massively robust, easily scalable and hugely impactful.



We don't believe that all open-source components need to be used, we believe whatever is used should be interoperable to the extent that all data and logic should be accessible in clear open text / language such that it could be ported easily to another provider. This is a crucial topic we believe in and have experience in. When complex technologies like data mesh get deployed they have some components that are open source which are great, but are not 'free' at all, they require significant commercial support contracts to be alongside the 'free' code, to make it work in an enterprise setting. They also don't come with integration that is tested at scale with other libraries and systems. In Palantir's Foundry, we use a raft of open source technologies and believe in them fundamentally, we just don't use them exclusively. We also contribute to a lot of these open-source projects such as Apache Kafka.

We believe that a thin layer is critical to success, where all the things that it makes sense to build once and re-use can be housed, and then the 'nodes' are free to do what they do best. Concentrate on building what the regional energy flex systems need to maximise flexibility, not debate whether this database or that needs to be replicated or who's code is better. We believe that the focus, effort and discussion needs to be in how the flex markets have been incentivised, enabled and managed to peak performance.

**Thick Archetype.** As the most complex option this brings further advantages at the cost of the time required to develop the full solution. We believe the solution to be within the capability of our platform offering but have concerns that the potential need for a "big bang" deployment would likely slow down the realisation of the benefits that a simpler proposition (i.e. the Medium Archetype") would achieve. It may be more sensible to implement the medium archetype first and then once implementation has stabilised, look to expand the solution out to cover further capabilities as it becomes apparent that they are needed. There is also the risk that this archetype may not match what is actually required by the market as requirements are not completely known at this time and by trying to "reach too far" the archetype may require significant scope changes as the true requirements are uncovered, causing further delays.

#### 8. What is your view on the desirability and feasibility of the archetypes or your own alternative proposition?

We believe in the concept of the flex exchange layer that underpins regional flex exchanges. Using the summary in the document, we agree that data transfer relevant to procurement, operations and reporting stages of delivery is made visible via the exchange to coordinate more market activities and enable improved visibility on asset performance.

We agree that the layer needs the coordinating of data transfers in one place, creating a trusted 'single source of truth' for flexibility services. The exchange acts to coordinate activities across many markets, and by focusing on the data transfers, can accommodate changes to these markets. We also agree that auctions, dispatch, settlement, and payment continue to take place via established institutions, with the exchange model providing a means to coordinate and share this data to improve market outcomes.

The desirability of the Medium Archetype from an **Information provision perspective**, is based on the implementation of a multi-purpose Ontology as well as a data warehouse, used for registering participant asset, product and participant data either through APIs, or a User interface.

- An Ontology is so key because it is where the data model gets standardised, it is where the CIM based standardised asset information can be shared with other systems regardless of which underlying system it comes from. It is a representation of data objects that are irrespective of source system, and the relationships between them as well as the actions that they can take. For example it would know what a transformer of a certain rating was (132kv) and this would not be possible to poll-mount or interact with on a feeder level without other assets stepping down the voltage, therefore that collection of data objects, relationships and actions could be used to validate network topologies or connection requests in a small way and would need to be built upon.
- All FSPs register the technical pre-qualification information during the procurement stage (first time only registration). This again can be done through APIs or a User Interface, it doesn't matter technically, but the DSOs for example might already have a process / system that undertakes this and it can be integrated easily. The important point is that the APIs and the User Interface are built and that multiple parties have access to it as the first option.
- MOs can share visibility of markets and product eligibility requirements using the platform.

The consolidation of historic data and market rules on the data warehouse would provide opportunities to allow market participants to learn more about historical activities and improve their decision-making. It is also the only data that could be used to train AI / ML models and be used in predictive use-cases.

Historic data would also enable other users, for instance, financial parties, to examine market activities and better understand opportunities to offer finance to consumers based on asset performance. We believe that this is an absolute critical point, we strongly believe that the funding of 'green packages' to enable Net Zero on a regional individual building level should be a prime goal of all stakeholders. We believe that this is the only way to put asset classes together that are bankable therefore fundable by banks, therefore would be on a scale to reduce the price to levels that would incentivise individual home owners to 'pull' us to Net Zero, as opposed to us 'pushing' to Net Zero which will not work.

The discoverability of participant, asset, and product data for other purposes, in alignment with Data Best Practice, would be drastically improved, far beyond the capabilities of siloed market administrators. With an Ontology; objects, relationships and actions can be standardised across the piece allowing appropriate discovery of all these factors not just the data.

We agree that Information provision could include prices and volumes that were sold, broken down by product and asset type that would support analysis of market trends. This visibility would support both asset valuation and risk calculation strategies for all participants, and third-party observers. We agree the SFE should actively maintain the common taxonomy of asset, product, and market participant definitions that are used to categorise, describe, and harmonise data across multiple markets.

The desirability of the Medium Archetype from a **Market coordination perspective** takes place during the procurement and operation stages. In both stages, the implementation of a rules engine enacts

complex stacking and primacy rules. This could take the form of competition and dispatch conflict notifications. We agree with this, the rules engine is fundamental to the layer across the board and needs to interact with the Ontology to rapidly build applications without / or with low code, which as stated, would benefit both MOs and FSPs from efficient market-clearing without conflicts.

Central registration and automation for FSP assets across flexibility markets is a key service that the exchange model would provide, reducing the burden of otherwise complex and manual repetition. We believe that this would enable assets to automatically understand eligibility requirements across regions and markets.

**Trust and governance** is improved by introducing new functions that have significant advantages, or are only possible, when provided by a sole independent public-interest entity. We believe that as enforcement is an option, it makes sense that this party is the regulator, OFGEM.

We believe that for all of these benefits below that it should be OFGEM that 'steers' the system, and has the leadership of a wider team that has 'responsibility' for the system, with a strategic technology provider to day-to-day 'run' the system.

- Clear management processes (such as for markets, standards, taxonomy, and rule changes) that participants follow to communicate change across the system.
- New enforcement processes, such as impartial routes to recourse for FSPs/MOs in case of disputes around exchange processes.
- Transparency of MOs disclosure on the rationale behind asset-dispatch decisions.
- Rating the performance of participants' assets across markets.
- Consolidate and make visible of historic product/asset/participant data to enable the identification of regulatory issues, market faults and security issue.

We believe a central **Ontology** is key to the development, delivery and operation of a data mesh / data ecosystem like the SFE. The Foundry Ontology connects analytics with operations, through a semantic layer that holds workflows across the enterprise accountable to a single source of truth. Objects and relationships in the ontology can surface analytics to operational users, and loop operational decisions back to analytical users.

Without an Ontology and the tools to make use of it, you are having to spend 50% or more of the project building and worrying about the underlying infrastructure of data integration, data warehousing, data catalogs, data governance, data lineage rather than focusing all that time on building the workflows, processes and decision support tools that will drive the real results of the SFE.

## Section 4

### 9. Should a common digital energy infrastructure be new-build, or should it buildout from existing infrastructure?

We believe that a common digital energy infrastructure should be new-build to take advantage of modern data ecosystem best practice, i.e. data mesh characteristics, streaming, AI/LLMs and cutting edge privacy and ethical tooling. This is not to say that existing infrastructure can't be reused in integrating to the system, sharing data with the system, and integrating processes to make this system work. For reasons of governance, security, risk, cost, agility, standardisation, we believe in the distributed control of a centrally coordinated system, a hub and node data mesh if you will, to be the best approach. To be specific we believe that the hub and the thin layer on which the nodes are built BOTH need to use the same foundational layer.

### 10. What are the important areas for consideration when designing institutional delivery models for a common digital energy infrastructure?

We believe that it's important in for a stakeholder mapping to take place, this will inform the required parties for most used cases. Each of the key stakeholders must nominate a team to respond for requests for data, process information and advice. These nominated teams would take part in the iterations of an end to end sets of use cases to show off the pilot system. This coordinated central team would be able to build the system at the same time that the distributed stakeholders were able to test the system and start the process of thinking what they would want to build in the node, for the regional flexible energy system. We don't need a 12 month use-case definition process. Thinking about the use case and not iterating on it, but we totally understand that refinements need to be made, we just believe that iterations inform direction and vice versa, and practical decisions, trade-offs and direction become quite obvious in that self-reinforcing environment.

In terms of structure we believe that a **single government team** that would be the 'steering group' for the system for OFGEM and DESNZ is a necessity. This will simplify who is 'steering' the system and making decisions which is crucial. We would expect to see subject matter experts here, digital leaders, programme experts as well as various other important stakeholders from within departments.

We also believe a **single technical consortium** should technically manage the day to day 'running' of the system for the steering group not a consortium or a group. Again we believe that this gives ultimate clarity, and best risk, cost, time trade-offs. This is not to say that they are the only technically contributing party, not at all, quite the opposite. We believe in a strong, distributed, technical sub-committee that should include cloud-hyperscaler representation as well as EDTF-type representation, and Data Leaders from the OFGEM, ESO, DNOs, DSOs areas. This sub-committee would provide expert opinion to the Team.

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11. What are the important areas for consideration when designing financial delivery models for a common digital energy infrastructure?

A SIF like Discovery, Alpha then Beta approach would be great however we need to be more flexible on the financial amounts. This would allow the base use-cases to be developed in a 6 month Discovery phase with appropriate stakeholders and partners. The 12 month Alpha phase should conduct the iteration of 4 pilots, one each quarter starting in the first 3 weeks of the Alpha phase. The Beta phase would end with the system in production, again after iterations.