Innovation Insights

Making space as agile as technology

UK GBC

Delivery partner:

SWITCH ON
THRIVE YOUR FUTURE

With thanks to Innovation Lab lead partners:

CANARY WHARF GROUP PLC

Landsec

M&S
EST. 1884

Introduction

Changes in how we transact and use floor space today offer a real challenge to businesses operating within the built environment sector. A typical working day sees office space under-utilised by 30-40% (JLL, 2017).

Occupiers are not connecting with their work space in a way that serves them, in an environment of rising leasing costs.

On the other hand, global building automation and control is evolving rapidly, and the market is set to double in value to $55.5bn by 2021 (Gartner, 2011).

A projected 85% of building interactions will be managed by technology without human involvement. Building automation and control offer the potential to reduce the gap between occupier requirements and workplace response.

So how can we make space as agile as technology?

This was one question UKGBC posed at the inaugural Innovation Lab, a structured innovation programme to improve sustainability in the built environment that brought together corporates, SMEs and innovators.

To tackle it, UKGBC led participants through a step-by-step process on how to identify and define a challenge, then to think innovatively about a response, addressing climate change, resource efficiency, nature and biodiversity, health and wellbeing, and socio-economic impact in the solution.

But how have other innovators approached the problem of making space agile through technology?

These pages explore a range of practical and inspirational case studies in applied technology. The ideas covered contribute in different ways to a more sustainable built environment whether by accurately tracking, in real time, occupier activity or using flexible business models that ensure a more creative, and efficient, building use.

Draw on them for your own business advantage, customer benefit or supply chain improvement.

To find out more about the UKGBC step by step innovation process, and the help it provides, look at the Sustainable Innovation Manual that this document accompanies.

Canary Wharf Group have a strong track record of nurturing innovation, through Level 39 and initiatives like Cognicity. But for us the UKGBC Innovation Lab provided yet another perspective on how we can create the conditions for innovation to thrive in own organisation, work with other peers to tackle problems together, and consider new ways that the built environment industry can be positively disrupted. It was a brilliantly engaging and inspiring programme to take part in, and I'm already excited to take back the learnings to the business to further embed our culture of sustainable innovation.

Martin Gettings, Canary Wharf Group

About the Innovation Lab

In 2017 UKGBC brought together some of the brightest minds in the built environment to work on a programme of open innovation: Innovation Lab.

Through a process designed and facilitated by UKGBC and Switch On, the insight and idea generation was driven by lead partners Canary Wharf Group, Landsec and M&S. The lead partners worked collaboratively over a 12-month period coalescing around six face-to-face workshops to identify challenges and co-create solutions. These lead partners brought a wealth of experience and insight on the built environment as well as a real appetite to think differently and work together to challenge the status quo.

The Innovation Lab involved over 50 corporates, SMEs and innovators who came together to tackle the common challenges in the built environment, through a rigourous programme of open innovation. Guest participants were selected for the insights into a particular stage in the innovation process. Ultimately the process itself and pro-active sourcing of existing and emerging innovations successfully generated a wealth of breakthrough thinking on agile space.

Mapping Innovations

The Innovation Lab process broke down the agile space challenge into four, more manageable problems in order to focus the group's thinking:

- **Space that learns** – Developing buildings that adapt in real-time for user-centred workspace.
- **Space on demand** – Providing building users with the space they need, as they need it.
- **Space for people** – Delivering creative space that responds to individual preference, enhancing productivity.
- **Space for community** – Providing access to space that promotes user wellbeing.

UKGBC then called for innovators to offer details of their product or service, its development stage, and how it would make space as agile as technology.

The innovation lab provided a fantastic opportunity to think differently. We were given the time, space, and tools to challenge business as usual proactively, and think about new and exciting possibilities for us as a business, and as part of the wider built environment system.

Ed Dixon, Landsec

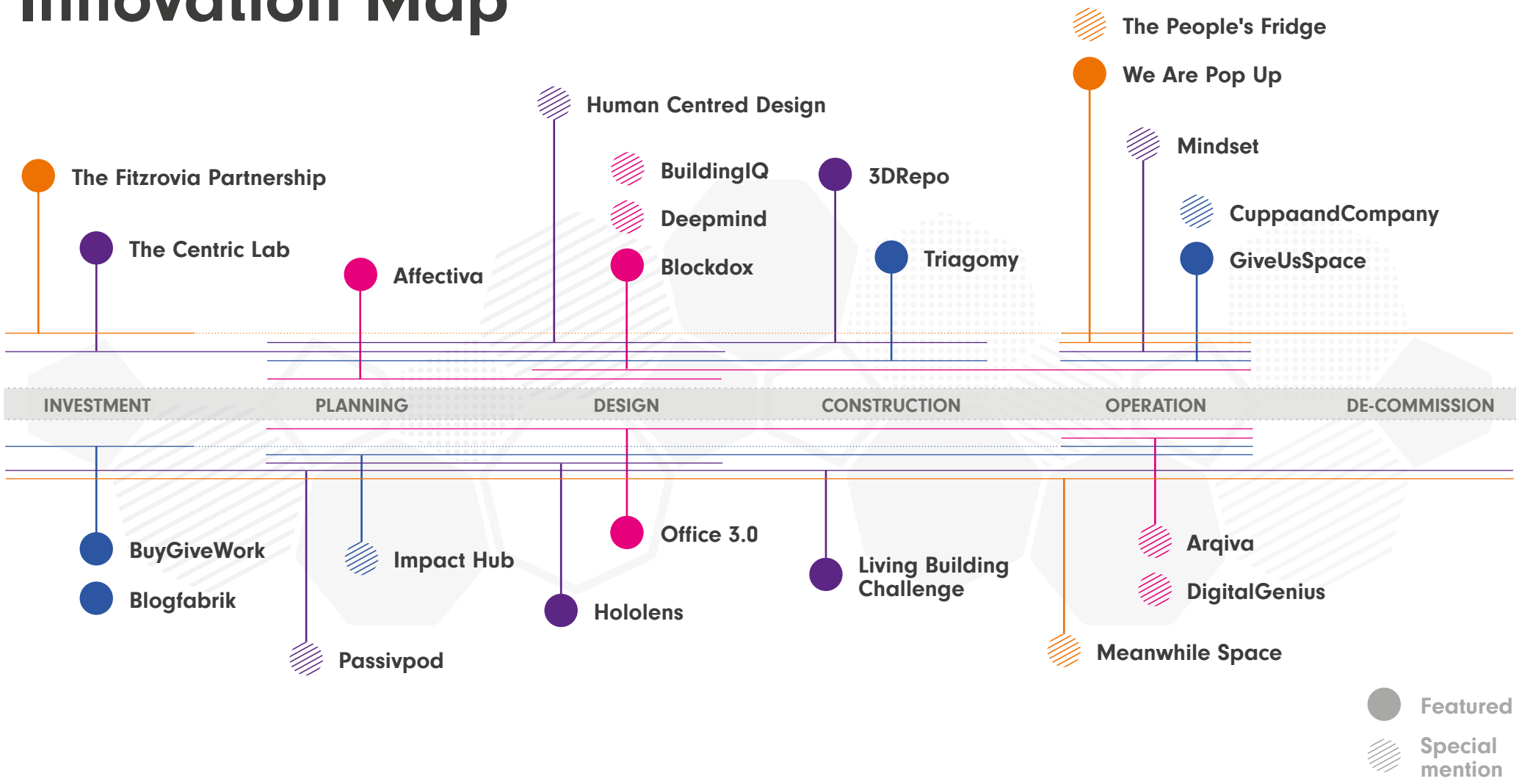
Selection criteria

Around 50 innovations were sourced and reviewed through the following criteria.

1. How does it contribute to solving the overall challenge of making space agile?
2. How does it approach the four problems identified?
   - Space that Learns
   - Space on Demand
   - Space for People
   - Space for Community
3. What development stage is it at: concept, prototype, pilot, commercialised?
4. How does it challenge business as usual, or offer a breakthrough solution?
5. Does it contribute to UKGBC's vision of a sustainable built environment?
   - Mitigating and adapting climate change
   - Eliminating waste, maximising resource efficiency
   - Embracing and restoring nature and promoting biodiversity
   - Optimising health and wellbeing
   - Creating long-term value for society, and improving quality of life.

The Agile Spaces Innovation Map

The Agile Spaces Innovation Map provides a snapshot of how new products, services, and business models might be applied to deliver agile and more sustainable space within the built environment lifecycle: Investment; Planning; Design; Construction; Operation; De-commission.



Challenge
01 Space that Learns

Challenge
02 Space on Demand

Challenge
03 Space for People

Challenge
04 Space for Communities

Challenge

01

Space that Learns

Technologies that gather building usage data or facilitate adaptability and user-responsiveness.

Workspace is offered commercially at a price per sq ft, based on the assumption that occupiers need a given area for a given staff headcount at minimum risk and cost. However, as technology and flexible working changes occupier habits, space needs are changing too. Real-time building usage will be the key metric for pricing – data that is not simple to gather or access.

- By 2020, 85% of customer building interaction will not involve a human. (Gartner, 2011)
- The market in big data and cloud-based services for smart buildings is projected to grow from $9.17bn in 2015 at 33.2% compound annual growth rate to nearly $30bn by 2020. (Memoori Business Intelligence, 2015)
- Building automation and controls market projected growth to $55bn in 2021 (Technavio, 2017)

How can we develop a model where buildings adapt in real-time to create user-centred, productive workspaces?

Affectiva

www.affectiva.com

MARKET READY

"Emotion as a service" to help companies understand how their brands make people feel

What is the innovation?

A service that analyses video footage of customer-brand interactions to accurately determine their mood and emotions, feeding this data back to brands where it can then be used as part of a marketing or positioning strategy.

How does it address the challenge?

Affectiva's ability to remotely assess emotion without the need for face to face consultations or surveys enables a more accurate read of a users' experience and can enable space providers to make more informed decisions about space use to improve it.

How does it work?

Brands supply Affectiva with raw video footage of customers interacting with their brand. Affectiva then analyses this footage using facial recognition to identify expressions and then compares it to an expansive repository of emotional data. The results are then charted and visualised for ease of consumption and fed back to the customer on demand.

How can this technology be applied to help us understand how spaces make people feel?

BlockDox

www.blockdox.com

MARKET READY

Using artificial intelligence and machine learning to make spaces smarter

What is it?

BlockDox is a product service solution that, while able to harvest data using custom sensors, focuses on aggregating and interpreting building data, making it easier to understand and a reliable enough platform on which to base building management decisions.

How does it address the challenge?

Buildings contain valuable data that can be difficult to extract and interpret – currently buildings are collecting data that is not standardised and remains unused. BlockDox can collect this data and analyse it alongside other data sources to form an accurate picture of space use.

How does it work?

Unique sensors detect information about space usage inside a building and other surrounding spaces which is usefully interpreted, enhanced and made available in a dashboard hub to property owners and building managers. Powerful algorithms harness the very latest in computational power to process immense amounts of data collected from micro-sensor technology.

BlockDox is also a highly interoperable platform. In addition to its own features, the data can be shared and accessed by trusted partners - providing the client with a seamless, curateable & easy-to-use business decision making tool.

How will being able to understand building occupancy as well as performance enable us to create spaces with the capacity to respond to its occupants' needs in real time?

Office 3.0

www.carloratti.com

MARKET READY

A digitally-augmented workspace that can adapt to users' needs

What is it?

Architecture firm Carlo Ratti's refurbishment of the Agnelli Foundation's headquarters in Turin employs devices and building services connected via the Internet of Things that enables a personalised heating, cooling and lighting system that can follow occupants around the building.

How does it address the challenge?

Open plan and flexible workspaces are becoming more prevalent, but the environmental preferences are difficult to cater for, with most workspaces employing a one-size-fits-all environment for large open areas. The Office 3.0 design principles allow for all user preferences to be catered for, reducing energy use and increasing user comfort.

How does it work?

The building is littered with sensors that monitor different sets of data, including the location of the building's occupants, temperature, CO2 concentration, and the availability of meeting rooms. Building occupants can set their preferences for a variety of metrics via a supplied smartphone app, which then communicates with the building management system (BMS) to adjust environmental conditions as the user moves around the building.

How can this design methodology help designers create spaces that not only react, but anticipate users' needs?

Additional Innovations

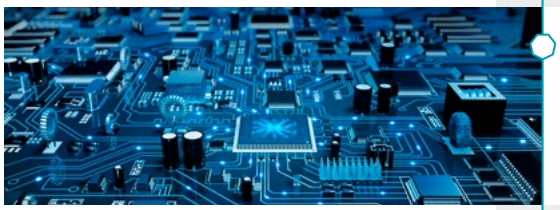
As part of our research we looked into many relevant models and technologies - many more than we were able to feature. On this page we signpost some of the other interesting ideas we found that could enable spaces that learn.

DeepMind: Helping to reduce Google data centre cooling bill by 40%

DeepMind, acquired by Google in 2014, is the world leader in artificial intelligence research and its application for positive impact by pushing the boundaries of AI, developing programs that can learn to solve any complex problem without needing to be taught how. By applying DeepMind's machine learning to our own Google data centres, we've managed to reduce the amount of energy we use for cooling by up to 40 percent.

BuildingIQ: Greater operational efficiency and improved occupant comfort through AI

The BuildingIQ platform learns and evolves with a building's needs or that of a portfolio of buildings. Deployment occurs once, when a user engages with BuildingIQ, giving building owners and operators the ability to select the services that best solve today's problems, and then easily add new services to tackle tomorrow's demands.



Arqiva: The internet of things comes to building management systems

Arqiva, a UK communications infrastructure company, has developed an Internet of Things networking protocol that will communicate directly to each device, including deep inside buildings. This is part of their suite of services to connect devices inside buildings, which includes smart metering communications for 10 million homes.

DigitalGenius: Improved customer care through an added layer of artificial intelligence

DigitalGenius brings practical applications of deep learning and AI to customer service operations. It analyzes incoming messages, predicts meta-data, routes cases, provides agents with accurate suggestions and automates responses. The opportunity that this could be applied to concierge systems within buildings and workspaces.

Challenge

02

Space on Demand

Models and technologies that enable methods of providing space as and when needed.

Traditional pricing models for office space do not allow for evolving occupier needs during the term of a tenancy. The assumption is that occupiers require a fixed physical space, and value the stability of a fixed contract over dynamic one that can encompass evolving business needs.

- 5% of London office space is sitting vacant annually (JLL, 2017)
- Around half of the UK's workforce of 30 million work in offices. Commercial offices are a major building type: 29% of all non-domestic stock with a total value of £224 billion, 31% of all UK commercial stock. (Property Industry Alliance, 2013)
- Office space is underutilised by 30-40% in a typical work day (JLL, 2017)

How can we connect building users with the space they need at the time they need it?

BuyGiveWork

www.keetonsandcollett.co.uk

MARKET READY

Buy-one-give-one comes to property

What is it?

3Space at Keetons & Collett offers a range of fully serviced workspaces for small to medium-sized businesses. For every workspace purchased, one further space is offered free of charge to a not-for-profit, local start-up or experimental project.

How does it address the challenge?

As the cost of workspace in larger cities continues to increase, it becomes more difficult for small, agile and innovative organisations to get the space, advice and support that they need to flourish. BuyGiveWork offers smaller companies the opportunity of high quality workspace which they might otherwise not receive.

How does it work?

Keeton's and Collett offers private offices and fixed desks close to London Bridge in London for competitive prices. For each desk taken, one is offered to a non-profit start-up that benefits the borough of Southwark. The customer is then offered the opportunity to become a mentor or advisor for them, promoting collaboration and cross-pollination of ideas.

How can alternative finance mechanisms enable flexible workspace, but also promote diverse occupancy to facilitate networks that would not otherwise be possible?

Blogfabrik

blogfabrik.de

An agency whose currency is content

What is it?

Blogfabrik is a Berlin-based creative agency that relies on the talents of its network of freelancers. In exchange for two pieces of work for the agency per month, freelancers are offered a desk and resources that they can use to produce their own work. Using an alternative economy model enables those without the financial means to leverage their desireable skills.

How does it address the challenge?

Businesses struggle to find the resource they need at the time they need it, while freelancers and contractors find the precarious position of contract work to be stressful. Blogfabrik offers an alternative economy method to address this problem.

How does it work?

Creators and designers sign up to become members of the Blogfabrik – a network of collaborators and content providors – who then, in exchange for two articles per month for the Blogfabrik agency, are able to use the agency's space and resources free of charge.

How could this alternative currency model be adapted to match space-seekers with space-providers and potential employers

GiveUsSpace

Give Us Space

Where your perfect office finds you

CONCEPT

Where your perfect office finds you

What is it?

GiveUsSpace turns the current office letting model on its head: bringing the market to the customer, and not the customer to the market. Using the GiveUsSpace (GuS) platform, would-be office occupiers can advertise their requirements and receive competitive "bids" for their business from office providers.

How does it address the challenge?

This model increases the likelihood that occupiers will find a space that meets their needs, while simultaneously driving up standards – including in sustainability and wellbeing – by increasing visibility and choice. It also introduces a potentially transformative feedback loop, allowing tenants and landlords to rate one another.

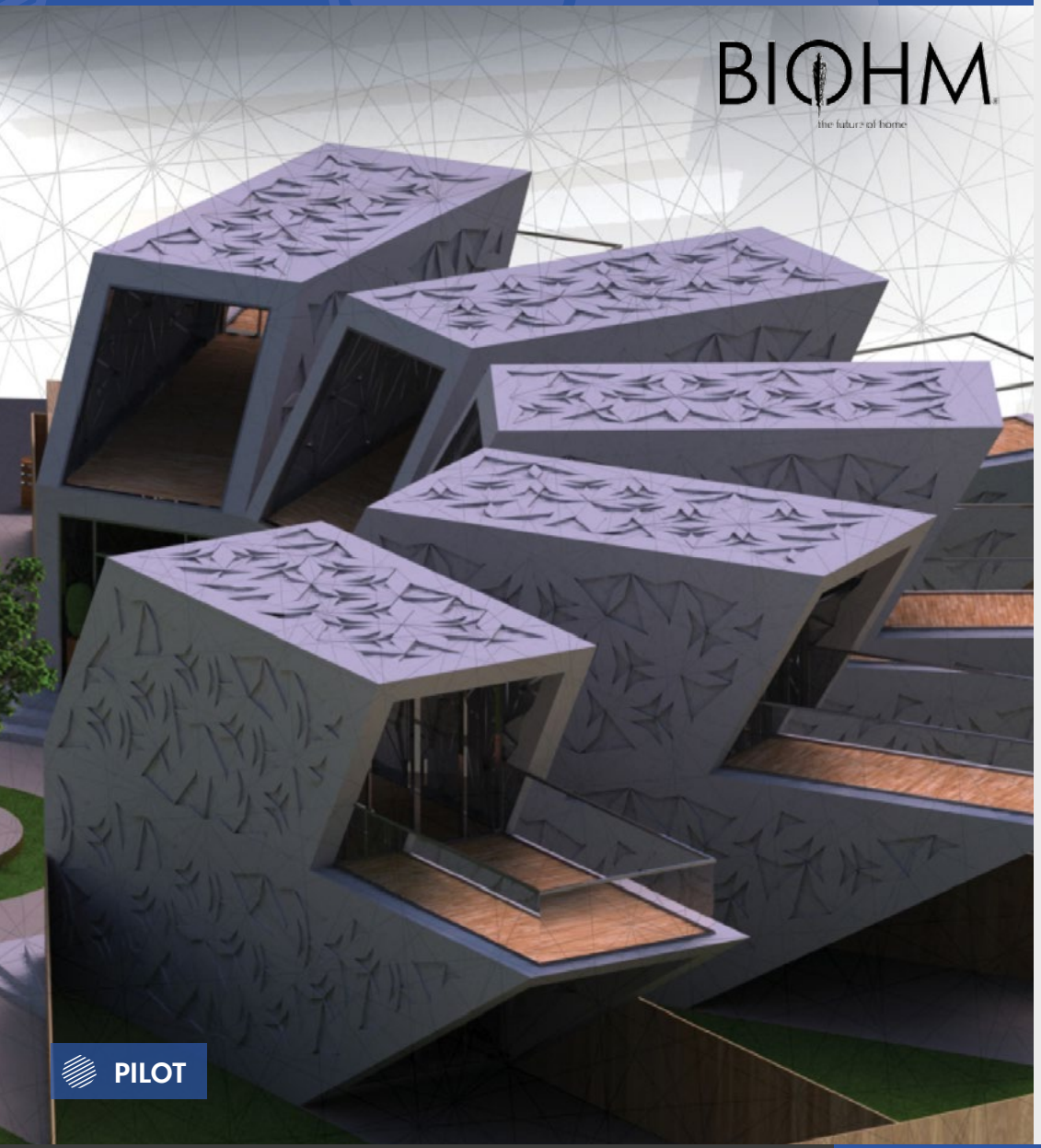
How does it work?

- The occupier registers with the platform and posts an anonymous "notice", specifying their key requirements.
- Office providers make "bids" against the advert, highlighting features such as cost, quality and sustainability.
- Occupier shortlists one or more offers to explore further.
- Occupier makes their final selection and agrees to lease the space.
- Immediately following the transaction and over the course of the lease, GuS prompts the tenant and landlord to provide feedback, including the quality of the space provided.
- Rating system incentivises office providers to continuously improve offer.

How could this model be used to connect tenants to the space they need when they need it?

Triagomy

www.biohm.co.uk/triagomy



A carbon negative construction technique designed to adapt

What is it?

Triagomy is an interlocking construction system that does not require binding materials, additional fixtures or fasteners to create robust and agile structures in a fraction of current build times. It allows buildings to be deconstructed and reconstructed at any stage of their life; eliminating demolition, making downsizing and upsizing a much easier process and facilitating end-of-life approaches such as recycling and reuse.

How does it address the challenge?

Buildings are often designed and constructed with little consideration for future use and adaptation, often resulting in their demolition to make space for a replacement space that meets the required needs.

How does it work?

During construction, the exact number of parts necessary are ordered and all prefabricated parts are simply assembled on site in approximately 5% to 8% of the construction time in traditional builds. Due to the absence of permanent fixtures and binding materials, the system can easily be reconfigured and deconstructed at any stage of its life to adjust the size of the building or to be moved to a new location. Such flexibility improves the relationship between occupants and buildings and offers an advanced level of customisation.

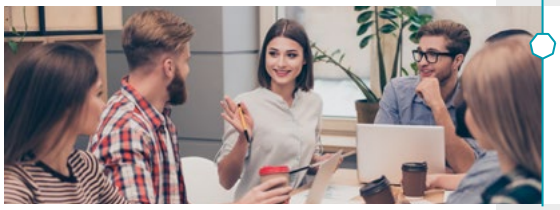
How could we make non-destructive fixing methods standard in construction, allowing spaces to be adapted, dismantled or moved on demand?

Additional Innovations

As part of our research we looked into many relevant models and technologies - many more than we were able to feature. On this page we signpost some of the other interesting ideas we found that could enable spaces on demand.

Impact Hub: A global network of people, places and progams that inspire

Part innovation lab, part business incubator, and part community center - Impact Hub offers members a unique ecosystem of resources, inspiration, and collaboration opportunities to grow impact. Impact Hub is a global network of collaborative workspaces based on a membership structure - membership enables you to use spaces in their buildings all over the world to conduct buisiness that has a commitment to social change.



Cuppaandcompany: Combating the loneliness that comes with working from home or on the road

Cuppaandcompany was set up for those agile workers and small business owners that need the support and camaraderie of colleagues, without the corporate structure and environment. It's primarily organised as a series of semi-formal meet-ups at pre-defined locations, and members can sign up to be notified of the next meet-up in their area.

Challenge

03

Space for People

Business models and technologies that add value to workspace.

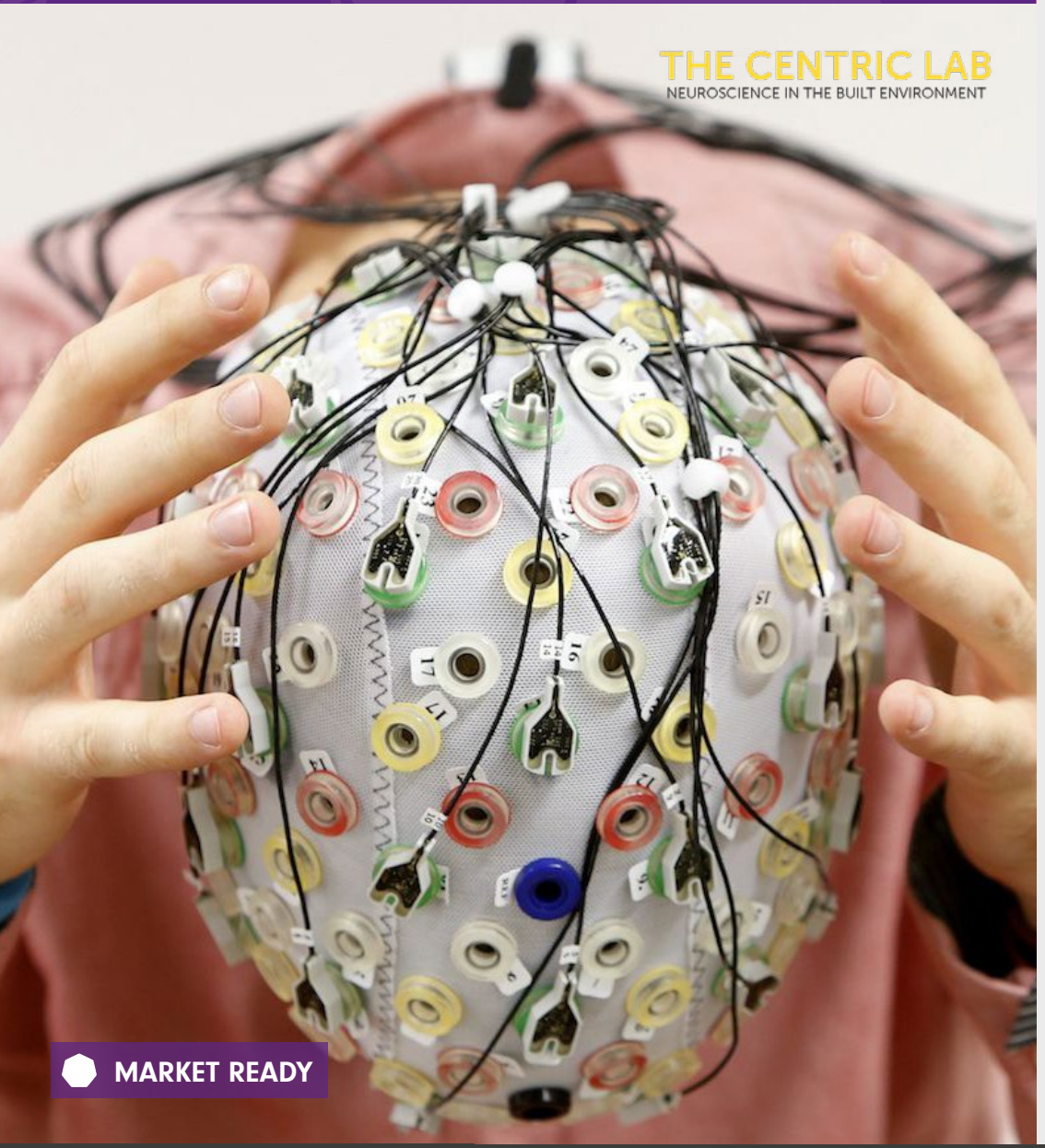
Standardised office space does not allow people or businesses control over their environment. Business models that use and manage space differently, and provide non-traditional services add value for users, promoting creativity, productivity and delight.

- Over a quarter of respondents to the What Workers Want survey did not believe that their workplace design enables them to work productively (Savills, 2016)
- The built environment has a demonstrable effect on the mental health of its users: city-dwellers are 21% more likely to experience anxiety disorders than those who do not live in cities (Peen et al, 2009)
- Poor mental health costs the UK £35 billion a year in lost productivity, recruitment and absence, up from £26 billion in 2007 (Centre for Mental Health, 2017)

How can we deliver spaces that enhance individual creativity and productivity, whilst responding to business needs?

The Centric Lab

www.thecentriclab.com



MARKET READY

Enhancing building user-experience through neuroscience research

What is the innovation?

The Centric Lab gives empirical scientific data, crossed into architectural design language and cultural data to help decision makers better understand the people they're trying to sell to and attract.

How does it address the challenge?

Neuroscience helps explain how humans perceive their environments, how they process information across the senses and make sense of the world around them. These insights when distilled and contextualised empower decision makers to design human-centric spaces, places and environments. It allows decision makers to become more outcome led.

How does it work?

Developed under the guidance of world leading neuroscientists at University College London, Centric Lab has created a unique analytical framework to understand the relationship between space and experience. It defines the subcomponents of human experience from a psychological and cognitive point of view and relates these to specific physical aspects of the built environment. This gives professions the ability to ethically relate the brain sciences to the physical world. The outputs come in unique IP that is deployed into different stages of the design process.

How could this technology be used to create spaces that can anticipate the needs of its users?

Hololens

www.microsoft.com/en-us/hololens

MARKET READY

Augmented reality for collaborative design

What is it?

HoloLens is a self-contained virtual reality headset developed by Microsoft. Its interface is designed to have a variety of applications – a prominent one being in product and building design. The headset allows the user to explore virtual objects and space as if it were in front of them, and interact and make alterations in real-time.

How does it address the challenge?

Buildings and spaces are designed for people to occupy them, but when given the opportunity to have their say, they're often presented with traditional means such as plans, sections and models, which require a leap in imagination that they may not be used to. VR can help us truly understand how the space will work for them.

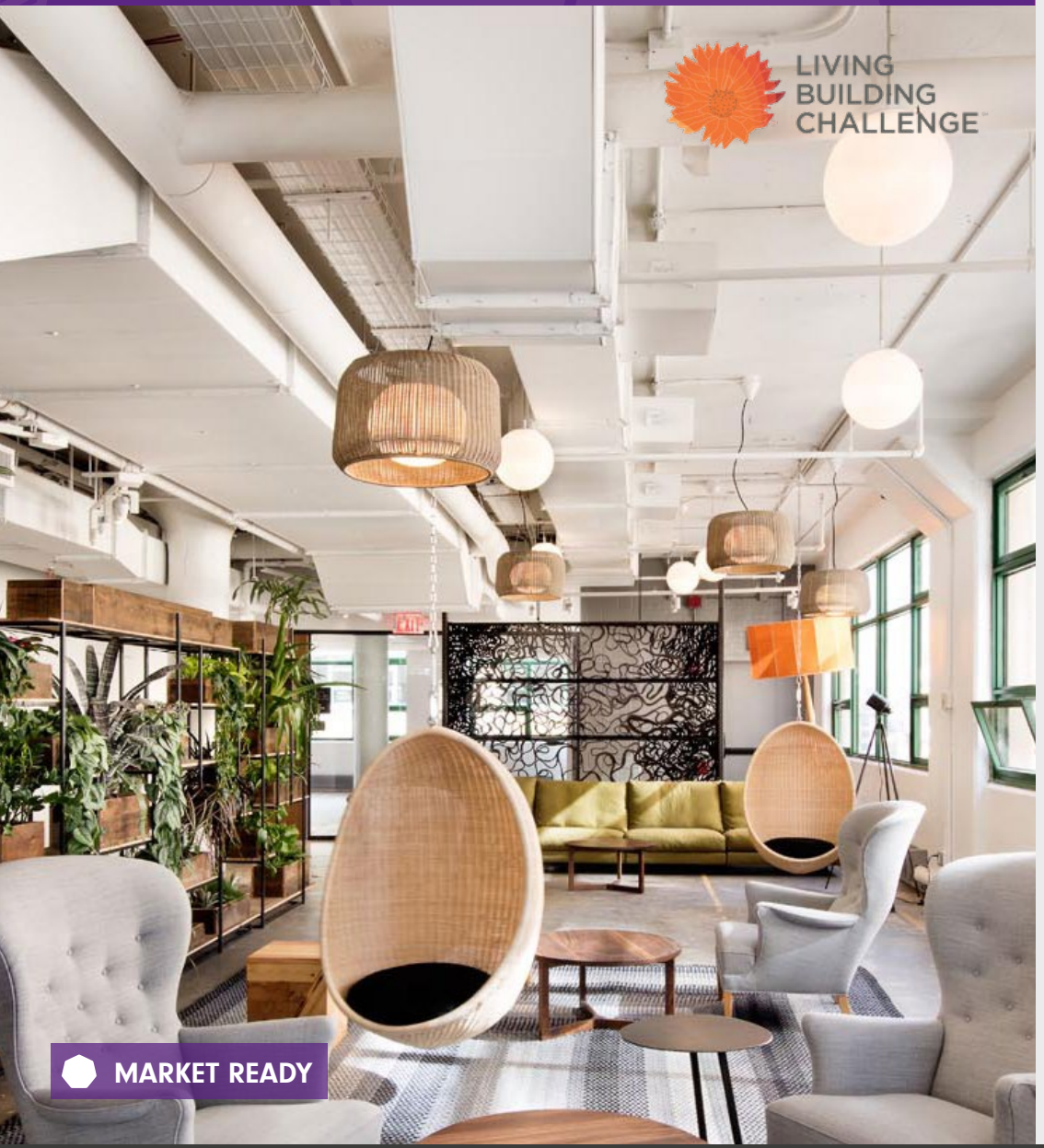
How does it work?

There are already a range of design and visualization suites available for HoloLens that interact with industry standard tools – buildings and spaces can be designed initially through traditional means, and then transferred to HoloLens for more involved visualization. The easily navigable virtual model can then be shared with stakeholders for feedback and alteration in real-time, allowing a level of informed collaborative design that is difficult via other means.

How can augmented and virtual reality be harnessed to better inform people about how buildings work and aid in a more inclusive design process?

The Living Building Challenge

www.etsy.com/living-building-challenge



MARKET READY

An aspirational certification for net-positive spaces

What is the innovation?

The Living Building Challenge is an ambitious building design methodology that aims to produce buildings that have a restorative influence on their environment and communities. For example, Etsy's redevelopment of their Brooklyn offices presented an opportunity to lead the way and create, in their words "a fully restorative ecosystem".

How does it address the challenge?

Buildings and construction account for 42% of all greenhouse gas emissions, and this continues to rise, having a negative impact on communities and the environment.

How does it work?

The Living Building Challenge's requirements are called "imperatives", which are spread around seven categorised "petals". While it is rare for a building to complete all imperatives within all petals, Etsy's offices aimed to complete as many as possible, while taking inspiration from others that weren't possible to complete within the confines of the project. The Etsy offices have completed four of the seven petals, including materials, place, health & happiness, and beauty. By achieving "petal certification", Etsy hope to create a space that supports the development of their people, as well as the wider Brooklyn community.

How can a collaborative approach be used to include building users in decisions around building use/alteration?

3DRepo

3drepo.org

MARKET READY

Leveraging building information modelling for collaborative design

What is the innovation?

3DRepo is a tool for building design to allow easy collaboration and increase workflow efficiency. Through a user-friendly platform, it allows all stakeholders the ability to review designs and comment. Such a tool reduces the time required in back-and-forth consultations, but also reduces the risk of miscommunications and incorrect version histories.

How does it address the challenge?

Buildings and spaces are designed for people to occupy them, but when given the opportunity to have their say, they're often presented with traditional means such as plans, sections and models, which require a leap in imagination that they may not be used to. VR can help us truly understand how the space will work for them.

How does it work?

3DRepo is a cloud-based software package that works with industry standard design packages by overlaying added collaborative functionality onto BIM models such as an issue ticketing system. The system ensures that only the latest version of the model is being used and distributed, and allows stakeholders to be involved at all stages via an intuitive web portal.

How can a collaborative approach be used to include building users in decisions around building use/alteration?

Additional Innovations

As part of our research we looked into many relevant models and technologies - many more than we were able to feature. On this page we signpost some of the other interesting ideas we found that could enable spaces for people.

Atkins Human Centred Design: Using technology to put wellbeing at the heart of design decision making

Atkins' award winning, digital design toolkit supports an innovative engagement process that enables clients and building users to articulate and prioritise the aspects of the built environment that are most important to them in terms of their health and wellbeing. These priorities are captured and inform the building brief, interpreting and testing different design solutions, to create a building that's truly bespoke to its users' needs.

Passivpod: A Zero-carbon modular passivhaus combining comfort, sustainability and flexibility

Passivpod addresses diverse social and environmental needs with flexible sizes: a home to reduce utility costs; eco-lodge to bring tourism to deprived rural areas; office to improve productivity; classroom enhancing cognition and sustainability education. PassivPods will be factory- prefabricated and transported to site in modules for quick assembly with our design-and-build service.

Mindset: Smart headphones that improve your focus

Mindset is the first all-natural way to improve your concentration. Mindset tracks your focus throughout the day, and alerts you whenever your concentration drops. Over time, these alerts train your mind and rewire your brain to better tune out distractions.

Challenge

04

Space for Communities

Business models and technologies that leverage community and consumer engagement.

Businesses must increasingly look to engage directly with customers and communities. In a world of apps, groups, websites and flyers, business models that provide physical space opportunities and experiences for consumers will create value and business differentiation.

- For 60% of millennials a "sense of purpose" was a factor in their current employer choice. (Deloitte, 2016)
- 25% of respondents to the English Housing Survey believed their area has got worse during 2015-2016. (Ministry of Housing, Communities and Local Government, 2017)

How can we provide access to workspace that people value, and that promotes wellbeing?

We Are Pop Up

wearepopup.com

Flexible pop-up retail opportunities

What is it?

We Are Pop Up connect retailers with brands to offer pop-up space on a flexible basis. Ostensibly a marketplace for space, it also fosters a network of innovative and challenging retailers and opens up routes for collaboration and cross-pollination for the benefit of the local community.

How does it address the challenge?

The majority of retail spaces on the average high street are both too large and too inflexible for fledgling businesses that are still trying to find their feet. Conversely, retail occupiers find themselves tied into long-term leases with a lack of flexibility to manage volatile retail markets.

How does it work?

WeArePopUp is an online platform that enables smaller businesses to find short-term "pop up" retail space within larger retailers to suit their needs. Larger retailers list their space and smaller ones select partners based on brand alignment for collaboration, or just to make use of available space to sell their products or engage with customers (for example in the form of an information point).

How could a similar approach be applied to space to create flexible space for communities?

The Fitzrovia Partnership

fitzroviapartnership.com

MARKET READY

Businesses working together to benefit environment and community

What is it?

The Fitzrovia Partnership is a Business Improvement District (BID), a geographical area where local businesses have voted to invest collectively in improving their environment.

How does it address the challenge?

Without a clear framework, businesses and retailers occupying the same space work in a vacuum, never realising the potential of collaboration for the benefit of the local community.

How does it work?

The Fitzrovia Partnership covers a specific area – businesses within this area are invited to participate in the BID which is funded through a levy on elegible businesses, then The Fitzrovia Partnership works with community groups, residents and the local authorities to deliver on key themes identified by members set out in their business plan. Such activities include street festivals to drive up footfall for the benefit of smaller retailers, improving the efficiency and sustainability of waste management, and operating as a collective voice for all stakeholders in the area.

How could this approach be adapted to create interactivity and community ownership of space?

Additional Innovations

As part of our research we looked into many relevant models and technologies - many more than we were able to feature. On this page we signpost some of the other interesting ideas that we found that could enable spaces for communities.

Meanwhile Space: Making intelligent use of unproductive empty buildings and underused land

Meanwhile Space CIC is a social enterprise at the forefront of 'meanwhile uses'. Meanwhile Space designs innovative solutions to vacant commercial space, working across sectors to deliver 'meanwhile' projects and strategies, operate affordable workspace, and deliver longer term developments. Meanwhile Space's approach to community engagement and local regeneration projects involves nurturing a sense of place and distinctiveness through the harnessing of vacant commercial property.

The People's Fridge: A public fridge where people can give spare food, to those who need it

The Peoples' Fridge is a community owned refrigeration unit hosted at Pop Brixton in south London with the intent to reduce food waste through the collection and free distribution of good quality surplus food to those that need it. Various similar schemes operate around the country.

I absolutely loved the UKGBC Innovation lab experience. It was so energising to think like an entrepreneur, with a clear process to be guided through, that didn't feel anywhere near as scary as I would have thought it might be. It was amazing how much commonality there was between the lead partner organisations in the challenges we're facing, and to have the opportunity to work together to identify solutions was brilliant.

Jess Palalagi, Marks & Spencer

From insight to action

UKGBC hope that these examples will inspire action on the design, construction, and operation of space that is as agile as technology will allow, to create a built environment that promotes wellbeing, offers social value, reduced energy use, and encompasses nature.

What you can do:

- Show this document to colleagues, clients and suppliers, as a snapshot of innovation today.
- Follow up on the innovations. Implement trials of the products and services.
- Feedback to innovators what works and what could be improved to aid application at scale.
- Tell us at UKGBC about your innovation. The UKGBC site and forthcoming Innovation Portal will host it.
- Share other innovations with us that deliver agile and sustainable spaces.

And finally…

These pages cover innovations available today. Tomorrow's ideas and innovations are up to you. Consult the *Sustainable Innovation Manual*, work through the framework and contribute to a sustainable future.

References

- By 2020, 85% of customer interactions will be managed without a human. (Gartner, 2011). https://www.gartner.com/imagesrv/summits/docs/na/customer-360/C360_2011_brochure_FINAL.pdf
- It is estimated that the market for Big Data and Cloud Based Software and Services in Smart Buildings will grow to over $9.17 Billion in 2015 and at a rate of 33.2% CAGR to nearly $30 Billion by 2020. (Memoori Business Intelligence, 2015). https://www.memoori.com/global-market-big-data-smart-buildings-will-reach-29-billion-2020/
- Total market value of the global building automation and controls market to grow from $29.8bn in 2013 to $55bn in 2021 (Technavio, 2017). https://www.technavio.com/report/global-automation-global-building-automation-and-control-systems-market-2017-2021?utm_source=T4&utm_medium=BW&utm_campaign=Media
- 5% of London office space is sitting vacant (Q4, 2017) (JLL, 2017) JLL Central London office market report Q4 2017
- It is estimated that around half of the near 30 million workers in the UK work in offices. Commercial offices continue to be a major building type, representing 29% of all non-domestic stock. At £224 billion, the total value of offices represents 31% of the total value of all UK commercial stock. (Property Industry Alliance, 2013) Property Industry Alliance - Property Data Report 2012
- Office space is underutilised by 30-40% in a typical work day (JLL, 2017, Occupancy Benchmarking Guide). http://www.us.jll.com/united-states/en-us/office-space-benchmarking
- More than a quarter of people surveyed in the What Workers Want survey don't believe that the design of their workplace enables them to work productively (Savills, 2016). http://pdf.savills.com/documents/What_Workers_Want_2016.pdf
- The built environment has been shown to have a demonstrable effect on the mental health of its users – those living in cities are 21% more likely to experience anxiety disorders than those that do not. (Peen et al, 2009). http://www.gwern.net/docs/nature/2010-peen.pdf
- Poor mental health costs the UK £35 billion a year through lost productivity, recruitment and absence costs, up from £26 billion in 2007 (Centre for Mental Health, 2017). https://www.centreformentalhealth.org.uk/News/mental-health-problems-at-work-cost-uk-economy-349bn-last-year-says-centre-for-mental-health
- A survey by Deloitte found that six in ten millenials say that a "sense of purpose" is part of why they chose to work for their current employer. (Deloitte, 2016) https://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/gx-millenial-survey-2016-exec-summary.pdf
- 25% of the English population believe their local area has got worse over the past two years (2015-2016) (Ministry of Housing, Communities and Local Government, 2017). https://www.gov.uk/government/statistical-data-sets/attitudes-and-satisfaction

UKGBC offers no commercial endorsement of individual solutions mentioned.

The selected examples are provided as a source of inspiration, and we do hope that you follow up with the innovators to find out more.

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