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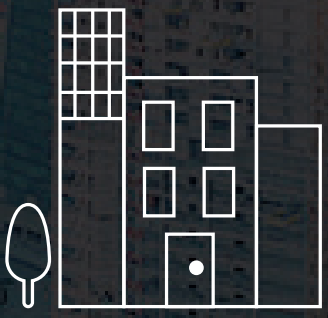

SMART CITIES

What will the Future look like and what new careers will they create?

A Wenham Carter Career Perspective

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THE FUTURE
It's estimated that by 2030, 5 billion **people will live in cities** compared to 3.6 billion now, an equivalent increase of over 1 million people every week. And by 2050, it's estimated that 66% of the world's population will live in urban areas.

5 BILLION

SMART CITIES PRACTICE

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INTRODUCTION

Cities are the future. It's estimated that by 2030, 5 billion people will live in cities compared to 3.6 billion now, an equivalent increase of over 1 million people every week. And by 2050, it's estimated that 66% of the world's population will live in urban areas.

Burgeoning populations, environmental challenges, and the political and economic forces of globalisation – all place pressure on the city not only to function, but to optimise. It is against this backdrop that the concept of the 'Smart City' has emerged, a quasi-utopian vision of an efficient, automated and beautifully designed metropolis, fully integrated into the natural environment and adapted with the needs of communities and civilians in mind. A crucial tenet of the Smart City is the idea that we can use technology (in particular sensors, big data, IoT and machine learning) to help cities best serve the needs of its citizens. These cities will be responsive, collecting data to inform and feed into how the city should be operating – and it's hoped that the end result will be increased economic growth and quality of living.

But in real terms, what might such a city look like? And how can we mitigate against the potential threats that come with such interconnectedness? Here are some developments that may well become a reality within our lifetimes...

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DRIVERLESS CARS: INTERESTING PLAYERS

- Streetline
- Veniam
- Anagog
- Blyncsy

DRIVERLESS CARS AND INTELLIGENT TRANSPORT SYSTEMS

Congestion, pollution and accidents: they all have a human and economic cost. More intelligent transport systems can significantly reduce these. We could see more transport sharing to optimise use; with the number of vehicles deployed at any one time a result of information gathered on people's usage patterns. We're already seeing companies emerge in this space, take the examples of Zagster and Bridj - who have both created platforms for vehicle sharing . Perhaps we'll go one step further to have all transportation integrated. A Finnish start up, Maas Global has created Whim, an app which allows users to manage and pay for all modes of transport in one app.

Parking, which has long been the headache of the city driver, is also set to evolve. It's claimed that the average resident of Paris will waste 4 years of their life looking for parking, but smart parking firm Streetline is looking to change that already. They integrate a number of data sources into a hybrid platform, including cameras, sensors, mobile, payments and GPS to help drivers find real time parking spaces, as well as feed the data back to municipalities to inform them precisely where new parking spaces might be created. Once autonomous vehicles become mainstream, soon, your car will be able to park itself – without you in the vehicle at all.

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Low Carbon energy solutions

Cities in their current form are already putting strain on current electricity grids – and as we require even more data centres and electric vehicles, this problem is only going to get larger. 'Smart Grids' may be able to solve this – electricity networks build for the digital age, where data on usage, maintenance and fault detection can be sensed electronically and automatically fed back to a central control. By collecting data on energy demand, smart grids can better manage the supply to reduce cost and wastage. Renewable energy sources, traditionally harder to integrate as their output depend on unpredictable weather systems, could be managed using microgrids, a ground of interconnected loads that can connect and disconnect from the smart grid.

Interesting players: Utilidata, Varentec, Autogrid. Also, larger players like ABB, Schneider Electric, General Electric

Streamlined Infrastructure management

What could our future infrastructure look like? Street lighting that's low cost, low carbon, centrally managed, and able to measure metrics including traffic flow, pollution, parking to 'take the pulse of a city'. (see Telensa, StreetLight Data). Rubbish bins that sense when they need emptying to streamline waste collection (we're already seeing these installed by companies like BigBelly in cities including Bath, UK, and New York City). An effective system for pollution monitoring to direct people away from the worst areas and reduce harmful health effects (try Plume or Ambience data). Technology has a huge role to play in creating better infrastructure - the key is using connected sensors to collect actionable data. Currently, we are still in the process of collecting that data, and understanding how to use it meaningfully, but progress is rapid. In the future, machine learning technology will make better use of the vast bodies of data generated by the growing number of connected devices.

Interesting players: BigBelly, Enevo, Tridoni, Plume, Ambience Data.

Vertical Farming and "Urban Agriculture"

Exponential population growth puts a strain on natural resources. There is no doubt that technology will help agriculture become 'smarter' and part of this may well include integrating agriculture into our urban areas.

"Vertical Farming", where crops are grown indoors in tall buildings, helps reduce transportation costs, eliminates weather related crop failure and enables year-long productivity. Sky Greens, in Singapore is the world's first low-carbon, hydraulic driven urban farm, using rainwater, sunlight and a water pulley system to rotate crops for maximum efficiency.

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WHAT MIGHT HOLD THE SMART CITY BACK?

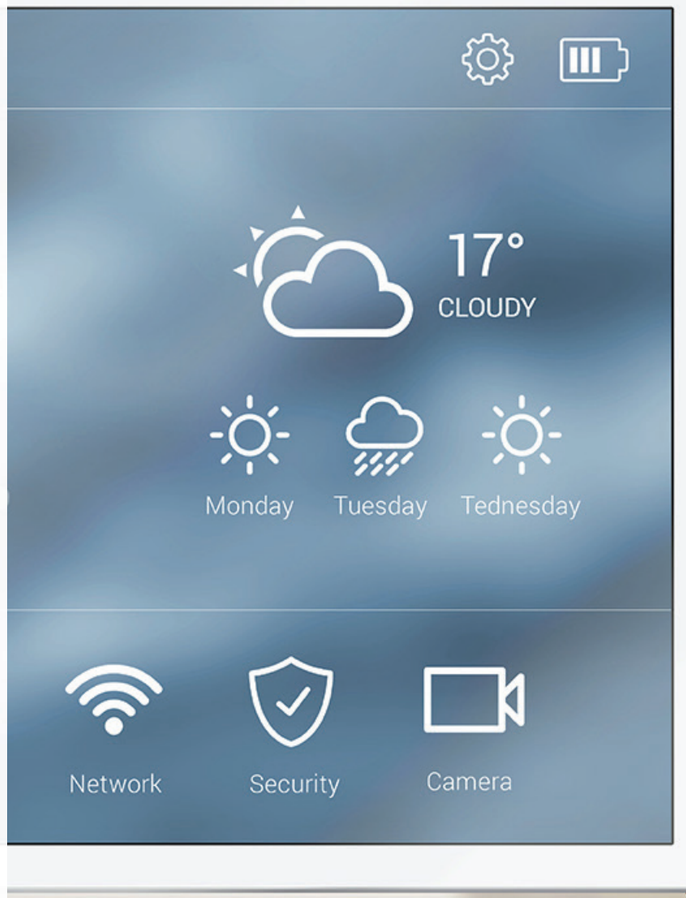
The smart city is about using information flows to continuously inform design and make the city work better for its citizens. But connectivity raises questions of security, privacy and ownership – and in more pessimistic narratives, the smart city opens our society up to new vulnerabilities and challenges.

Security: In light of geo-political events that have shaken the world recently, there are concerns that smart cities will be a target for fraudsters and terrorists capable of hacking through cyber defences to take control of our infrastructure, whether for political or financial gain. If these threats are not properly mitigated, there's a risk of economic damage, disruption to everyday life and in extreme cases even loss of life. While security is of course a concern of any firm in the connectivity business – some critics have accused the industry as a whole of not investing enough.

Privacy: Smart cities collect data on its inhabitants –where we like to go, when we go there, how we get there and even who we meet. Thus whoever has access to this data has the potential to build up an intricate portrait of the life of an individual, and its feared that governments could use this information to silence political dissent and discourage civilian protest. Even 'smart' concepts like predictive policing (the usage of analytical techniques to predict where crime might occur in a city), whilst praised with reducing crimes in cities like Los Angeles, undermines civil liberties by allowing police to make assumptions about whether someone is likely to be a criminal.

Inequality: Klaus Schwab, founder of the World Economic Forum, and author of a book on the 'fourth revolution' (ie the embedding of digital devices into our physical, social and biological world) warns that inequality "represents the greatest societal concern" associated with this new world. The biggest beneficiaries of the smart city are those contributing capital, both physical and intellectual, ie the innovators, shareholders, and investors. Automation will cost jobs, and it's feared that cities will polarise societies, by excluding workers with only their labour to offer, and creating an 'underclass' lacking the economic resources to be part of the new world.

Ownership: Who owns the Smart City? In theory, its citizens – in more positive lights the smart city is hailed as being open, democratic and collaborative. But data is the new currency of power, and depending on how new infrastructures are built – it could be corporations and governments who control the data and therefore how we live our lives. Freedom will take on new meanings; while we may be free to explore new virtual realities - we will have to comply with a new order to do so, perhaps sacrificing personal privacies along the way.



WENHAM CARTER:

Are you working in the smart city sector, looking for talent for your team or your next challenge?

Perhaps you are a data scientist, cyber-security or other professional and you think your talent could be applicable to this dynamic sector. We'd love to hear from you

please contact our **Smart City team on the team page** above.

SMART CITIES:
WENHAM CARTER'S CONCLUSIONS

The Smart City movement is hugely innovative and as with any rapidly evolving industry, talent is required to drive it. Jeanne Beliveau-Dunn, vice president and general manager of services for Cisco Systems, and chairman and CEO of the Internet of Things Talent Consortium, believes that Smart Cities will create a host of new jobs – futuristic sounding titles such as 'Digital Anthropologist', 'Neural Implant Technician' and 'Virtual Reality designer' make her predicted list of in-demand jobs.

We haven't yet searched for any Neural Implant technicians, but we do know that the smart city industry is breeding a new kind of talent, which is why we decided to create an entire division devoted to serving our clients in this sector. We're finding some migration of talent from telecoms, digital and semiconductors – but as Belivaeu-Dunn highlighted, smart cities are breeding new types of skills, often learned in-house, and it will be these profiles that will be most in demand as the sector grows. Data science, machine learning, robotics and cyber-security are all hot at the moment.

We're seeing innovation driven by a range of firms, with larger players including Huawei, Fujitsu, Cisco. The start-up space too, is healthy, dominated by sensor based / analytics companies whose capacity for data collection and analysis can be integrated into larger infrastructures. Both environments can be stimulating and dynamic places to work The smart city movement is global, and like in many of the niche industries we work in, clients are willing to pay for the right people from all across the globe. Silicon Valley and Spain are active in the start-up space, and although many cities are pursuing 'smart' agendas, eyes are on Dubai, who are aiming to be the world's smartest city (definition slightly ambiguous) and India, where the government are pursuing an aggressive modernisation policy including a 'Smart Cities Mission' with some cities build from scratch on greenfield sites.

No-one knows exactly how cities will look in 10, 20 or 50 years time – whether the vision of our efficient and beautiful metropolis is realised, or if the reality is more dystopian. What we do know is that there is a continued focus on making our cities safer, smarter, and able to cope with the influx of new inhabitants, and it is technology is driving this.

FOOTNOTES

1.https://www.streetline.com/how-it-works/
2. http://www.telensa.com/
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4. http://bigbelly.com/
5. http://www.enevo.com/
6. http://www.predpol.com/ucla-predictive-policing-study/

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