

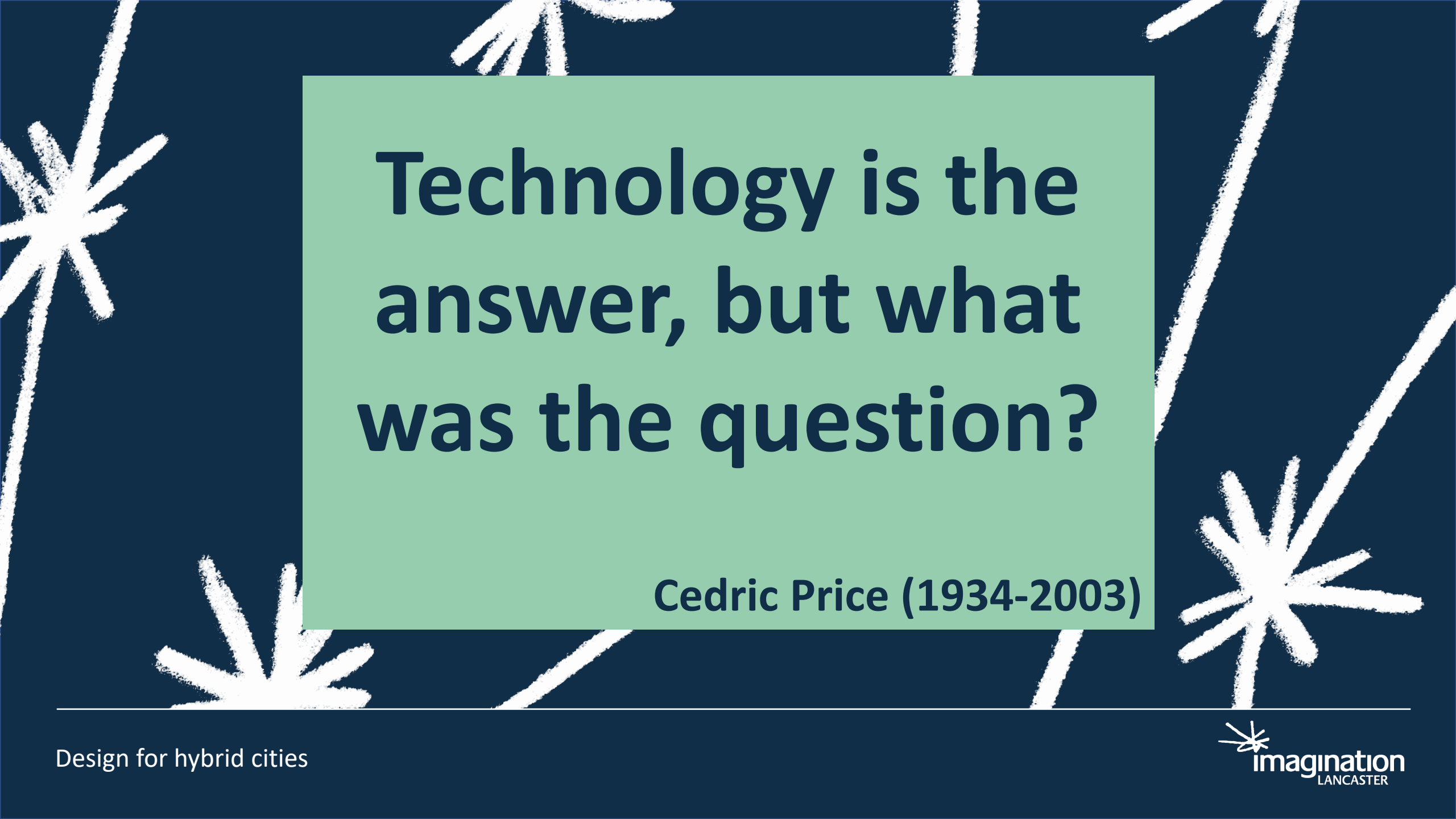
Design of socio-spatial networks and practices for hybrid cities .

Urban space and city life redefined in the context of hybrid cities.

15th International Conference on Design
Principles and Practices
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Lancaster
School of
Architecture.





**Technology is the
answer, but what
was the question?**

Cedric Price (1934-2003)

Hybrid cities

A Hybrid City consists of a real city with its physical entities and real inhabitants and a parallel virtual city of counterparts of real entities and people. Nevertheless, there will be no complete match between real and virtual entities.

“The digital twin is the virtual representation of a physical object or system across its life-cycle. It uses real-time data and other sources to enable learning, reasoning, and dynamically recalibrating for improved decision making.”

<https://www.ibm.com/blogs/internet-of-things/iot-cheat-sheet-digital-twin/>

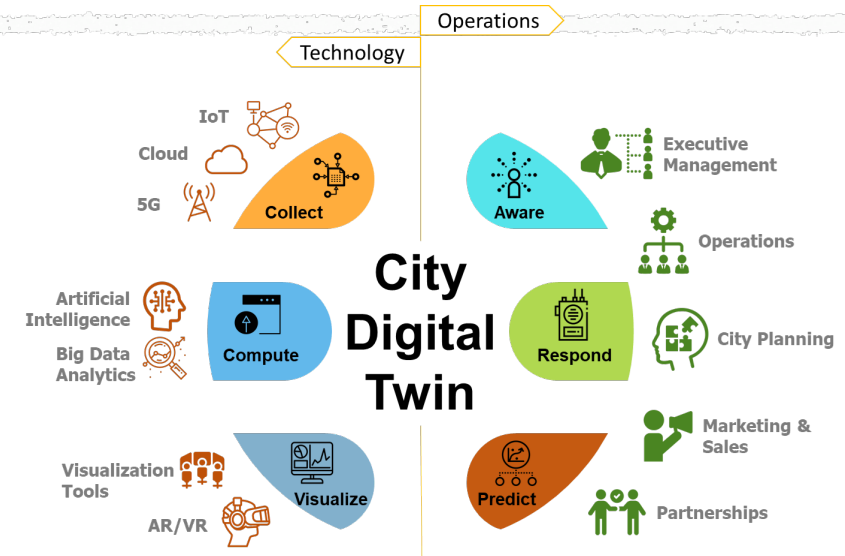


Dr. Norbert Streitz, SmartFutureInitiative



<https://www.smart-future.net/themes-and-issues/smart-cities/>

© Norbert Streitz



Data from/for anything?

“By 2025, it’s estimated that 463 exabytes of data will be created each day globally – that’s the equivalent of 212,765,957 DVDs per day!” (World Economic Forum)

Data centres account for about 1% of global electricity demand ^[1]

Demand for data services is rising exponentially ^[1]

The nature of data transmission is changing rapidly as more traffic flows through mobile devices and networks ^[1]

The value of the data economy of EU27 is predicted to increase to over €550 billion by 2025, representing 4 % of the overall EU GDP ^[2]

[1]: Transmission Networks, IEA, Paris <https://www.iea.org/reports/data-centres-and-data-transmission-networks>

[2]: Final Study Report: The European Data Market Monitoring Tool

https://datalandscape.eu/sites/default/files/report/D2.9_EDM_Final_study_report_16.06.2020_IDC_pdf.pdf

City Dashboards

Sensing and managing cities.

Hybrid city with focus on efficiency.

London

51.51 N, 0.13 W

Mon 8 Feb @ 15:31:21

Go to Map - Go to Grid - Change City

WEATHER STATION (CASA TEAM)

STATION	WIND SPEED	WIND GUSTS	DIRECTION	TEMPERATURE	HUMIDITY	RAIN TODAY	PRESSURE	FORECAST
CASA Office: Bloomsbury W1	Data not updated for 151 hours							

WEATHER (METAR)

London City
Winds NE-040 at 12kt. Vis 10km. Scattered clouds at 1600ft.
NE at 8 mph **-1 C**

TRAFFIC CAMERAS (TfL)

A23 Brighton Rd/Gemmell Close

TUBE LINE STATUS (TfL)

Bakerloo	Good Service
Central	Good Service
Circle	Minor Delays more
District	Good Service
DLR	Good Service
H & C	Minor Delays more
Jubilee	Good Service
Overground	Reduced Service more
Metropolitan	Minor Delays more
Northern	Good Service
Piccadilly	Good Service
TfL Rail	Good Service
Trams	Good Service
Victoria	Good Service
W & C	Planned Closure more

LONDON CYCLE HIRE (TfL)

2.9 % Stations Full	0.9 % Stations Empty
11179 Bikes Available	232 Bikes or Docks Faulty

Available Bikes (last 24h)

IN SERVICE (TfL)

6997 London buses
335 Underground trains

AIR POLLUTION (DEFRA)

µg/m ³ TIME AVGD	OZONE	NO ₂	SO ₂	PM _{2.5}	PM ₁₀
Bloomsbury					
Marylebone Rd					
N Kensington					

BICYCLES (LBH)

Goldsmiths' Row
766
yesterday

STOCKS (YAHOO)

FTSE 100 Index
6546.71
57.38 (0.88%)

[Tweet](#) [About](#)

UCL CASA NCRM JISC



Neighborhoods “from the internet up”



Digital Innovation

Catalyze digital innovations that help tackle urban challenges and establish a new standard for the responsible collection and use of data in cities.



The path to implementing these innovations

Sidewalk Labs recognizes that some of these proposed innovations would require regulatory or policy changes in order to be implemented. Sidewalk Labs also recognizes that these types of changes require significant review and analysis by public agencies at multiple levels and understands how challenging this process can be.

In preparing this proposal, Sidewalk Labs has begun discussions with Waterfront Toronto and government officials and looks forward to working through these complex challenges with the applicable authorities within each order of government.

Volume 3 of the MIDP includes a list of specific regulatory and policy issues, along with a proposed governance structure with which to implement alternative, innovative approaches.



The Quayside neighbourhood

This view of the Quayside site plan looks northeast towards the Gardiner Expressway. The plan incorporates a series of innovations around transportation, social infrastructure, housing affordability, digital tools, sustainable infrastructure, building construction, and public space

— with the goal of improving quality of life for Torontonians. It reflects 18 months of public engagement needed to refine these planning ideas and start to achieve Waterfront Toronto's ambitious priority outcomes.



SIDE WALK TALK

PRODUCT NEWS PMX SERIES FEATURES CITY OF THE FUTURE PODCAST ARCHIVE | SIDEWALK LABS WEBSITE

Sign in Get started

Why we're no longer pursuing the Quayside project — and what's next for Sidewalk Labs

Daniel L. Doctoroff [Follow](#)
May 7, 2020 · 3 min read



In [October 2017](#), Sidewalk Labs and Waterfront Toronto set out to plan a shared vision for Quayside, a fundamentally more sustainable and affordable community resulting from innovations in technology and urban design. Since the project began, I've met thousands of Torontonians from all over the city, excited by the possibility of making urban life better for everyone.

So it is with great personal sadness and disappointment that I share that Sidewalk Labs will no longer pursue the [Quayside project](#).

Top highlight

For the last two-and-a-half years, we have been passionate about making Quayside happen — indeed, we have invested time, people, and resources in Toronto, including opening a 30-person office on the waterfront. But as

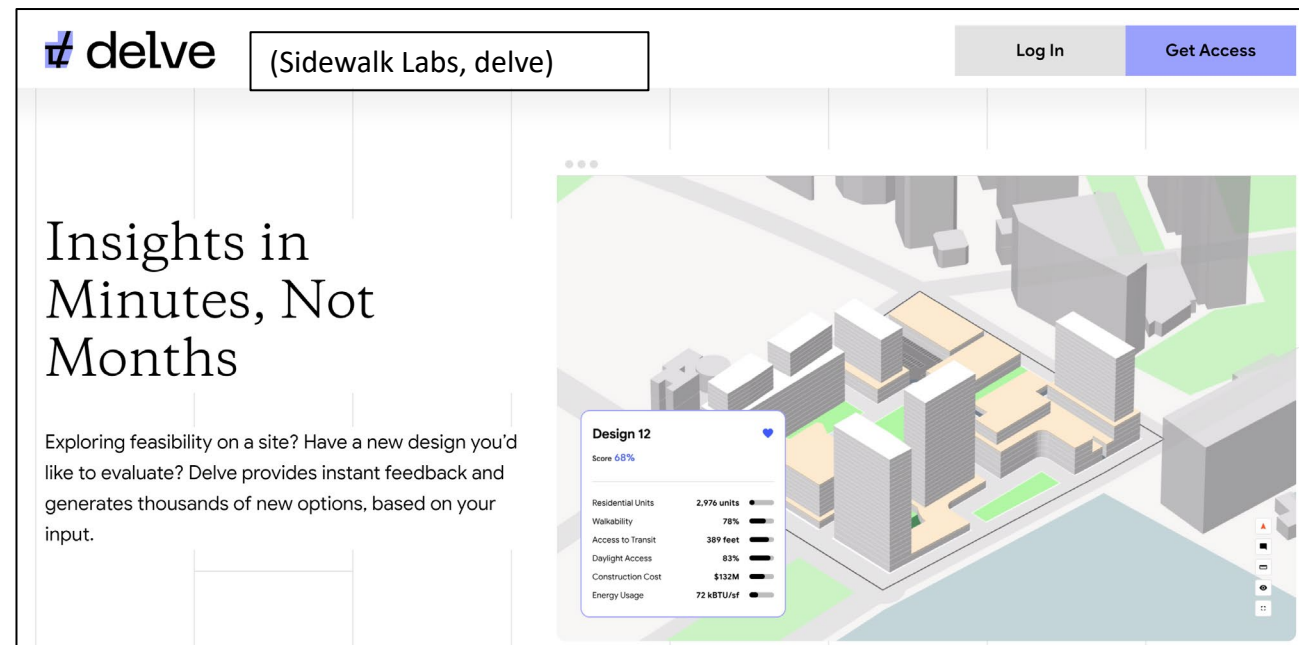
Digi - tecture

Options -> prêt-à-porter designs -> optimization/adaptation -> universal solutions to choose from

Transferability of methods / algorithms?

Design for space or people?

Transparency and access to public?

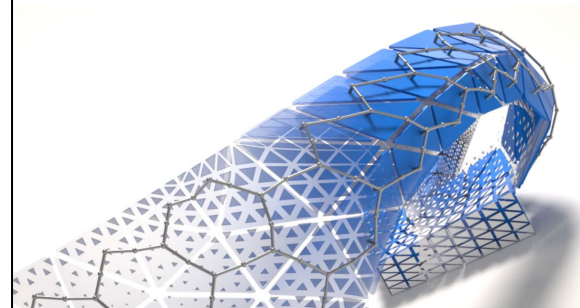


delve (Sidewalk Labs, delve) Log In Get Access

Insights in Minutes, Not Months

Exploring feasibility on a site? Have a new design you'd like to evaluate? Delve provides instant feedback and generates thousands of new options, based on your input.

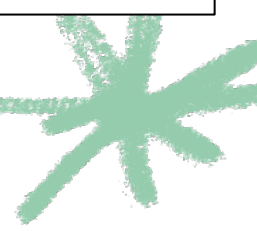
Design 12	
Score: 68%	
Residential Units	2,976 units
Walkability	78%
Access to Transit	389 feet
Daylight Access	83%
Construction Cost	\$132M
Energy Usage	72 kBtu/sf



What is generative design used for?

Generative design is used to provide practitioners the ability to quickly explore, optimize, and make informed decisions to complex design problems. Think of generative design software as an assistant that helps with creating, testing, and evaluating options.

(Autodesk, Generative design tools)



UrbanAlsation

Much

Privacy

Little

Control

Inclusivity

City infrastructure
monitoring

Smart home devices

Social media – city “pulse”

Wearable and mobile
devices

Cloud – data management

Training – testing -
validation

Algorithms

Optimisation

Post analysis

Visualisations

Dashboards

Design decisions

Final features / plans

Project development

Urban space

“Privacy by design”

“Everyware”

“Internet of Everything”

Black / Grey box processes –
Digi-tecture decisions

Architecture / planning
decisions



Space that works ... unexpectedly



How public space can be redefined in the context of hybrid cities?



[1] <https://www.publicspace.org/en/web/guest/works/-/project/g202-magic-blocks>

[2] <https://www.publicspace.org/en/web/guest/works/-/project/h294-fountain-hacks>

[3] <https://www.theguardian.com/travel/2014/jun/14/city-breaks-greece-turkey-bars-bazaars-boutique-hotels>

Deep learning

How can algorithms learn about context and empower decision making?

EMPATHY

....and contextual interpretation

How can we integrate empathy in the design and operation of hybrid cities?

General intelligence

AI-tects before the architects?

Human expectations -> AI perception -> realization

RETAIL OCTOBER 11, 2018 / 12:04 AM / UPDATED 2 YEARS AGO

Sponsored by 

Amazon scraps secret AI recruiting tool that showed bias against women

By Jeffrey Dastin

8 MIN READ



SAN FRANCISCO (Reuters) - Amazon.com Inc's [AMZN.O](#) machine-learning specialists uncovered a big problem: their new recruiting engine did not like women.

(Reuters.com)

If AI learns from current data that depict our society how can they design cities for the future?

Will they transfer all the bias and inequalities, or maybe cheat and design for themselves?



Human-datum to “Humanodes”

Most of us produce and share data constantly. This data transaction quite often is unconscious and unintended. The only direct return is information and “convenience” arguably.

- What is this information about, how is presented and who controls it?
- Can we understand and process the information ?
- How Hybrid Cities’ services can empower social interactions and activities?



[1]

What parameters and incentives affect the acceptability of data sharing and use in Hybrid Cities?

[1]: Credit: Floris Veelenturf as found in “Pavement lights guide ‘smartphone zombies’, <https://www.bbc.co.uk/news/technology-38992653>

Humans in the loop and in control

Digital twin cities : Operational efficiency and city management.

Hybrid Cites : Complex ecosystem of socio-spatial and digital networks; networks of digital twins and people.

Digital twin cities : Human in control but limited to developers.

Hybrid Cites : Dynamically developing, but human might not be in the loop. Rights / responsibilities of non-human agents?



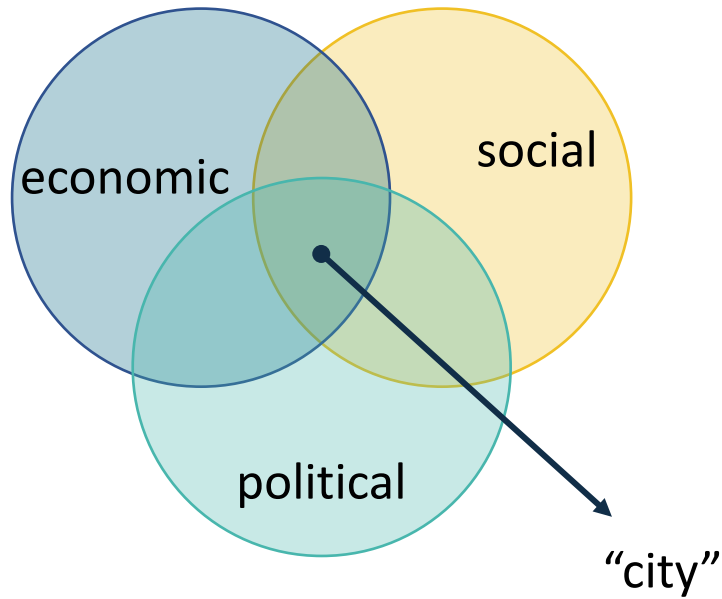
Digital layer eligibility

: Complex ecosystem of socio-spatial and digital networks.

Dynamically developing, but human might not be in the loop.



City design approaches



[1] Brazilia eBook, Created and produced by Bia Simonassi, TreeBookGallery.blogspot.com

[2] Shenzhen, model city. Image Source: <https://qz.com/1916774/shenzhen-represents-xi-jinpings-ideal-financial-hub/>



City design approaches

[1]

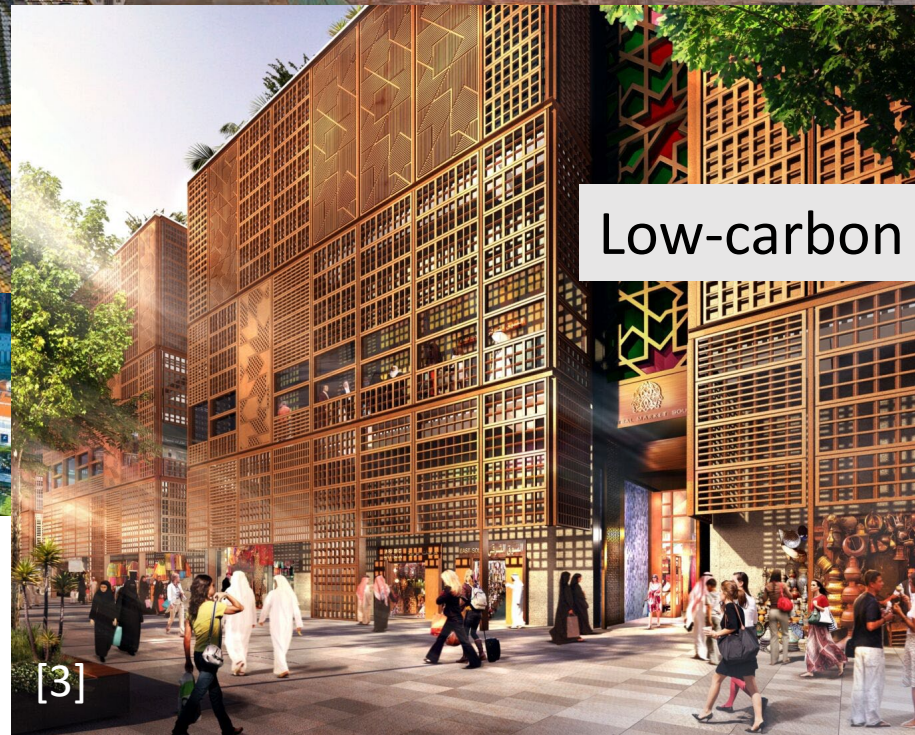
Smart



Liveable

[2]

Low-carbon



[3]

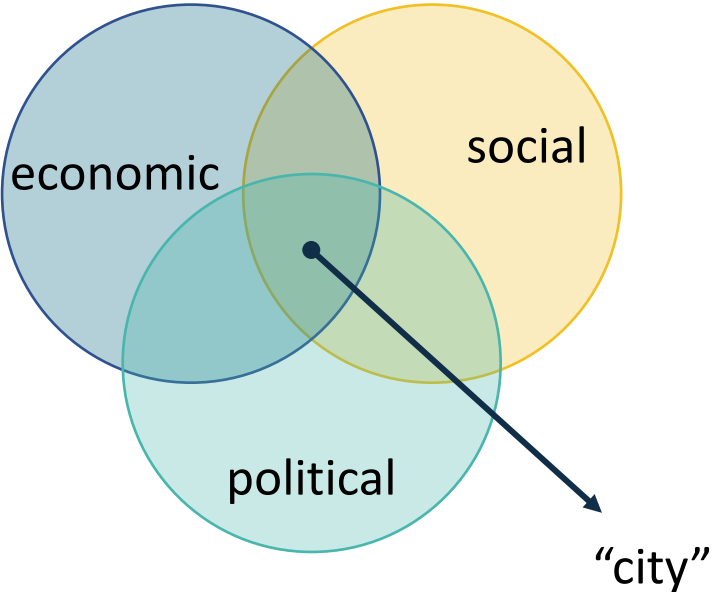
[1] Singapore smart city, <https://fintechnews.sg/34281/ai/singapore-ranks-first-in-global-cities-ai-readiness-and-smart-city-effort/>

[2] Vienna, Liveable city. Image by Christian Thür / 500px Images at <https://www.lonelyplanet.com/austria/vienna>

[3] Masdar, Low carbon city. Image: Central Market, Foster + Partners at <https://www.architectsjournal.co.uk/archive/masdar-city-abu-dhabi>



Design for Hybrid cities



Conclusion

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vestibulum quis vulputate neque, sed convallis ex. Cras vitae com modo libero, non cursus ante. Donec sagittis nisi eu magna porttitor pulvinar liquam id metus facilisis.

- Proin ligula elit, molestie vel tempor non
- Aliquam accumsan malesuada tempus
- Donec lobortis imperdiet dui quis porttitor metus interdum
- Suspendisse tortor enim, semper sit amet massa eget elementum fau
- Vivamus finibus fermentum ullamcorper
- In nulla tellus, dignissim at nunc sed estas sagittis tortor quis justo eu augue

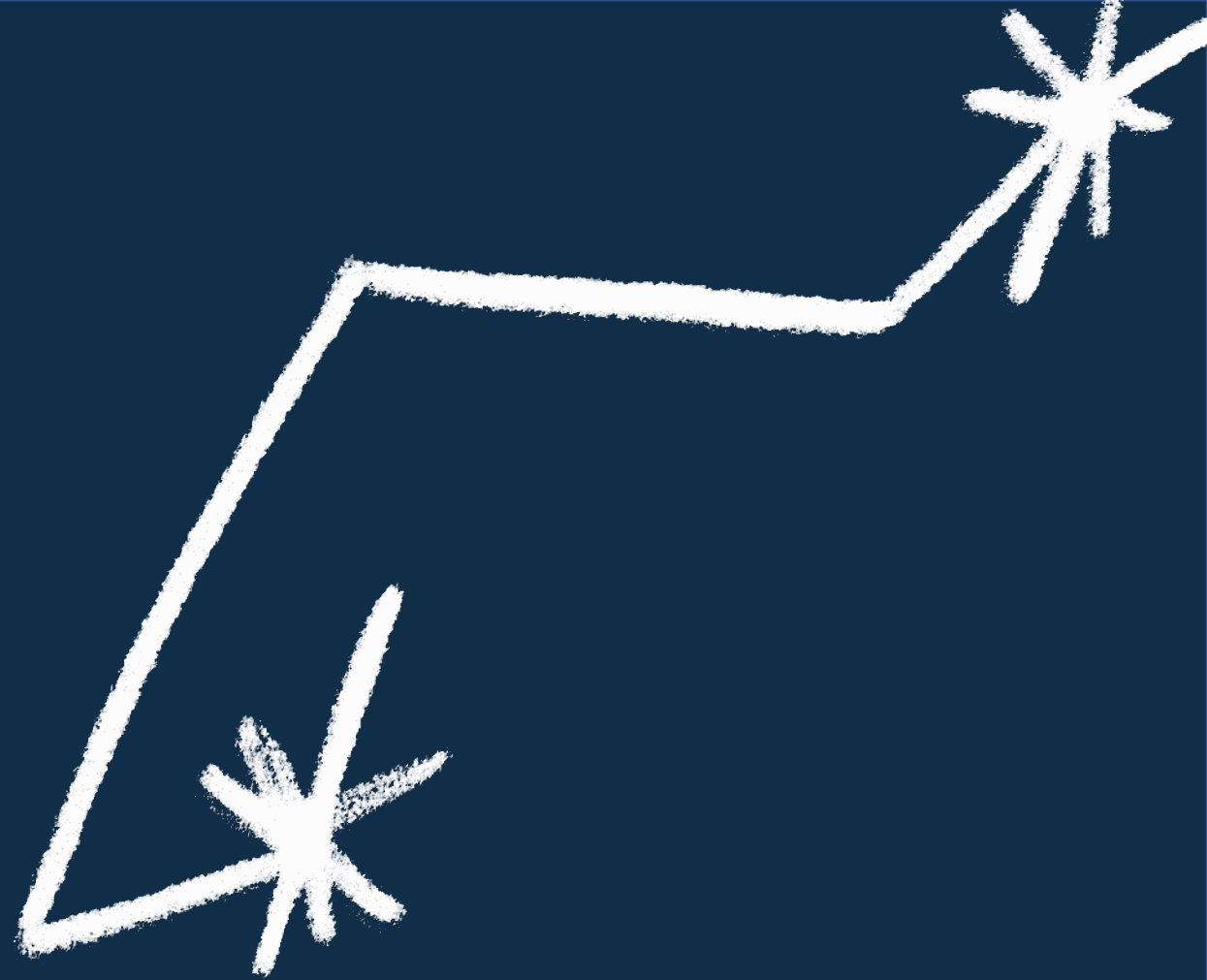


Thank You!

Any Questions?

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