Let's use digital to Go Circular... or should we?

The risks and rewards of digitisation

Green transition and digital transition are two themes shaping the EU's future. Though fundamentally different in their drivers and outcomes, these transformations must work hand in hand to meet the pressing challenges of sustainability and economic prosperity.

For city practitioners, the circular economy offers a tangible pathway to address resource inefficiency, while digitisation acts as a critical enabler - unlocking solutions through data-driven insights, real-time monitoring, and scalable collaboration. But the challenge lies in combining these two pillars effectively, ensuring digital tools serve well-defined circular economy goals without losing sight of local digital contexts and human-centric design. How can cities balance ambition with pragmatism to achieve this synergy?

Two pillars; different types

At the EU level, these two pillars of green and digital are critical. They must work hand in hand to drive societal change over the next decade and beyond. However, whilst they are linked, they are distinct in purpose and potential. The green transition, driven by urgent societal needs, focuses on adopting sustainable practices like the Circular Economy (CE) to address environmental and resource challenges. In contrast, the digital transition acts more as an enabler, spurred more by market and economic dynamics than societal necessity.

Digitisation isn't an end in itself; it must be tailored to meet specific circular economy needs. For cities, digital solutions often target three key areas:

- **Resource efficiency and waste reduction** through tools like real-time monitoring, digital twins, and Building Information Modelling (BIM);

- **Collaboration and data exchange** via platforms connecting people, materials, and opportunities;
- **Accountability and transparency** ensuring material traceability and source verification.

Technologies such as IoT, AI-driven analytics, and "maker" tools offer practical ways to enable these solutions and at scale.

Context is Everything

However, implementation must consider the Local Digital Context – the city's existing digital strategy, infrastructure, and policies. Every city operates within its own digital landscape, shaped by existing strategies, infrastructure, and capabilities. This context can either enable or hinder progress, depending on how well solutions align with these local realities. This context can be a double-edged sword: enabling projects with established frameworks or imposing constraints, like data-sharing incompatibilities or skill shortages.

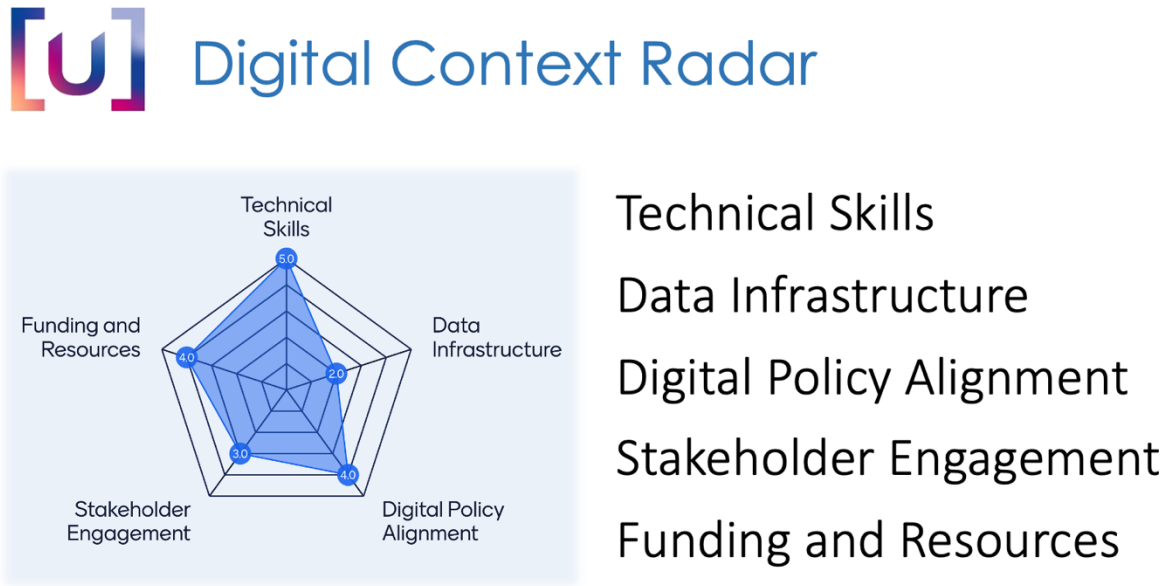
A city's local digital context can simplify some aspects of implementing digital circular economy solutions (e.g. providing an existing data policy and hub to work with; providing base technology to build upon; providing a partial support strategy etc.) or equally, it can add constraints on the implementation (e.g. a system isn't compliant with the data sharing policy for the city; solutions might not be able to integrate with existing systems that follow a different standard technical architecture; in house skills for support might not exist for a system etc.)

Working with this context includes understanding if there is a digital strategy for our city/territory, and if so what it is in and what policies it sets out. This can be about data strategy, technical architecture, system support models, development and staffing/skills goals, privacy and security protocols, to name but a few.

Risks and Rewards

Constraints aren't just negative either and can be beneficial when guided by a solid strategy. A good digital strategy and policies will ensure that new solutions fit within the developing digital context for a place – keeping solutions efficient, safe and sustainable, making best use of funding and resources available. However, if we aren't aware of these guard rails when we start a new digital project, we might go down a route that will be in unnecessary conflict with the existing digital context and policies we should be working within.

Thus, this digital context can be both an opportunity and a threat to projects. The key to success lies in proactively assessing this local context. It's important that we are aware of our local digital context and work with it not against it. One simple but helpful tool



that can help with this is the Digital Context Radar – a simple self-assessment diagnostic tool to help teams think about the context they are working with and where to focus their efforts when planning digital implementations.

Under each of the five areas, teams can ask themselves a series of questions / prompts to help understand the nuance of the local context, and identify areas of strength to leverage, and weaker areas that may need more attention to mitigate risks. Teams can then plan their digital work with a clearer focus on areas that are important for the success of their local project. Involving a wider set of stakeholders, such as in an URBACT Local Group, can broaden the insights and also act as a tool for building cohesion around a project or action plan.

It's Not Just Tech…

An area of this that is frequently overlooked is stakeholder engagement. We should treat all people involved in this wider digital context as key stakeholders and engage with them early in the process. This will increase awareness (and hopefully buy-in and support) and start to reduce some of the potential barriers to implementation that might appear further down the road.

This engagement is part of what I often call the "human side of systems" – the activities and roles carried out by people that either build, buy, implement or use digital tools. Many technology implementations that fail have focussed too much on whether tools are technically sound, without considering enough about the people involved. Are they also aligned with the project goals, do they possess the skills needed, are they operating within a context that allows or enables them to play their part in the right way?

Working Together

All this can be summed up as: digital transition within the circular economy context needs to be a approached in an "integrated" way. This is the core of the URBACT methodology, which is built upon the concept of using an Integrated Approach to sustainable urban development. By considering and connecting with all the relevant people and domains affected by circular economy actions with a digital component, we can choose better solutions that are better implemented, with a much increased chance meeting our circular economy needs and goals.

Digital solutions offer such a wide range of benefits for enabling the transition to a more circular economy that we have to include them in our thinking. Much of this is about data. Data collection, data flows, data sharing, data analysis… most circular systems either produce data as a core benefit, or rely heavily on data inputs to derive benefits. This is arguably true of all digital systems to a degree, but data relevant to circular practices being available *at scale* is one of the big benefits and drivers for digitisation in circular practices.

Modern digital solutions, including AI options, enable us to conduct data analysis on a scale not manageable by human / manual processes. Transparency and tracing of material flows, predictive analytics to help with forecasting future re-claimed material availability and matching these materials with potential users – all of these things can be done currently, but a manual process means that we cannot do them at scale. And to accelerate transition to a circular economy, we need to be looking at how we can do things at a scale large enough to have an impact at city and regional level.

For example, tracking the lifecycle of products and materials and matching reclaimed materials with new users can be done currently. However if it is not fully digitised and integrated with other smart systems, such as GIS / spatial mapping, material tracing databases, user/supplier marketplaces etc. the work to connect materials, suppliers and uses together is labour intensive and time consuming. Add in the predictive elements needed to *plan ahead* for re-use of materials e.g. when certain materials will become available, where and in what quantities, the tasks required become even more complicated.

Scaling that up from a targeted system to a larger scale (e.g. across a whole city rather than isolated buildings or locations) the complexity of the managing the process also increases on top of the additional labour/time needed. More relationships, more materials to match and track, more constraints and legal considerations, more potential suppliers and users etc. create a highly complicated and intricate system.

The data stored in and created by such systems at city level will also be vast. Whilst technical possible to interrogate these data using manual processes, modern digitisation, including AI, offers the opportunity to manage and process this data at scale. This offers further opportunities for insights and transparency not possible with systems that are not fully digital and integrated.

All this means scaling up a manual process and/or one that relies on isolated systems becomes too expensive in practice to deliver and manage, especially at the large scale needed for circular practices to be truly impactful at a city level.

Digitisation, however, offers us the opportunity to start to upscale what are currently more niche circular approaches to a city-wide level – taking circular practice from small and targeted interventions to a systematic approach on a larger scale.

The key question is: can we manage these two transitions in an integrated way? To unlock the full potential of these transitions, we must bridge the gaps between technology and circular economy with clear strategies, inclusive stakeholder engagement, and bold ambition. Let's use digital to help us go circular!

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