

Prolojik

The Challenge of Smart



On Friday 6th May 2022, Prolojik invited some of the leading thinkers in the smart building space to a roundtable to discuss the Challenge of Smart; a discussion around the challenges, opportunities, and outcomes from the latest generation of genuinely smart integrated buildings.

Asela Rodrigo, Prolojik Founder & CTO

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MY THANKS TO THE PANELISTS FOR THEIR INSIGHT AT THE ROUNDTABLE.

John Dente	Technical Director, ExcelRedstone
Matthew Masron	Global Market Sector Director, Arcadis
Ian Pierce	SPM Digital Placemaking, BritishLand
Linden Stephens	IOT Solutions Lead Architect, BritishLand
Kal Shadam:	Global Sales Director, Dialog
And the prolojik team	
Mark Lester	Managing Director, Prolojik
Edward Davies	RSM, Prolojik
Adam Chapman	RSM, Prolojik
Asela Rodrigo	Founder & CTO, Prolojik

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The discussion

What is a Smart Building?

What is smart? well it depends on who's perspective. On one hand, it is about the end user and their touchpoints with the building; interactive room booking, user experience apps etc. But it is also about the operation of the building around energy efficiency, space optimisation, where double digit footprint saving can be achieved by space usage insight.

How do we specify Smart Integration?

The process needs to begin in earnest at RIBA Stage 2. The scope ideally needs to be instructed by the End User.

"It's a mindset change, it's a behavioral change, that seems to be very difficult, but it needs to come from the people who are owning, operating, and managing the buildings."

The challenges with the traditional approach

The traditional procurement needs to be reviewed because the M&E split does not align with the holistic demands of smart buildings. The scope has to be protected through the procurement process to avoid dilution of the design.

"Once it gets into that procurement chain, any value gets written out, they call it value engineering, but all too often it is the race to the bottom"

One of the biggest challenges to smart integration are unrealistic cost plans.

"I absolutely hate that term [Value Engineering] because it's not Value Engineering. It should be finding a slightly different solution to the same sort of outcome and not compromising on what you're asking for. Whereas, you know, to a lot of people Value Engineering simply means stripping-out cost."

Life safety system integrity and quality data

Many of the systems we would like to get insight from are mission critical or life safety critical. A key requirement is getting quality granular data and not just system healthy, system in fault.

Examples include vertical transportation, emergency lighting and fire alarms. The panel confirmed that this is easily achieved by a “Read only” interface approach. Data from end points such as lift cars and emergency lights are available as payloads from the more capable manufacturers.

Define Open?

“Does it support open protocols? Yes, but then a lot of lot of systems do. Does it support an open vendor solution? Can it be bought and maintained from multiple sources?”

Specifications are using MQTT as the gold standard in smart buildings, but often they are not backed-up with the full definition of the ontology and interactions. Nor are the detailed divisions of responsibility between system suppliers, integrators and platform providers. MQTT is not the only answer. A hybrid approach of API, OPC, BACnet/IP and MQTT but with all data normalised for the presentation layer is the key.

Licensing Models

Many of the platforms operate on a SaaS (Software as a Service) model with up-front professional fees to cover the initial implementation. Some suppliers price on per device, or per m2 or based on data volume. The challenge is to choose which model suits the particular implementation.

Decisions also need to be made around the field level assets whether they be data collection devices or edge gateways, to quantify not just the Capex cost but the ongoing Opex of ingesting and uploading large volumes of data to the cloud for the complete life-cycle of the building.

Cloud Service

Where you store IoT data is a function of the client. The costs, particularly for larger projects or dense data insights can escalate quite rapidly. There is also a sustainability angle around the power used to store all of the information on the cloud.

“Better buying will drop the cost from 100k to 10k. There will be Gb of data generated if all devices as monitored in real time.”

Beyond the commercial aspects of selecting the cloud service, there are also pre-existing commercial and security agreements that need to be taken into consideration.

“Where the allegiances become a problem is if you're working with some Fortune 500 companies, because they have bought something from Amazon or Microsoft, typically, or in some cases, their own private cloud. If you do a bank, for instance, then you get told.”

Training & Competence

The training of the service delivery team is a critical aspect of smart integration. Having an educated frontline team will help both identify and resolve issues in multi-services systems. This will reduce the risk of technical ping-pong.

“The lights broken: what's wrong with it? is it the lamp that needs to be changed, is it a firmware update that brought it down?”

The skill training also needs to be tailored to the different types of spaces and skills. For example, the front-of-house team versus the back-of-house team.

“There's so many cases where client has bought the full kit and caboodle. The Starship Enterprise has landed, but no one knows how to fly it.”

Application of AI

End-users are often not interested in technology for technologies sake. They want clear insights on operation leading to rapid resolution of both potential and actual issues.

“I want you to tell me when something's gonna break, why it broke, and what's it going to take to fix it?”

The opportunity to use analytic data to predict and schedule maintenance for best component life and optimized service cycles.

“You know that the light can run 50,000 hours and where it is in its journey, so it is due for replacement in 5/6 months. You can schedule that change to be on a Saturday and it won't upset that floor.”

There is a need to build trust in predictive maintenance systems to ensure that the repairs are actually necessary. The best way to do this is by using an evidence-based approach. The system should also advise the user what the impact of not completing preventative maintenance would be, albeit that there will be factors such as usage, weather etc. which may impact the actual life of the component.

"If you don't do this, then you will waste X amount of energy over a period of a month before you probably would get the alarm to go and do it. "

There is genuine value of the AI algorithms. We are seeing Rule Engines and different algorithms to achieve outcomes. The value of the recipe books on various platforms will be part of the platform selection process. But rules are not enough, it is about the interpretation of the rules which will add value and what is purchased as part of vendor selection is that deep insight into the systems the vendor is delivering.

"There's a lot of AI companies popping up, especially in the Bay Area offering an algorithm to do X. But it's orchestrating that to say, well, if X happens, what is the outcome?"

IoT Security

The view on IoT security is very sector specific. For example, banking is very averse to sending data to the cloud.

"Cyber testing is critical. Key rotations, encryption standards, penetration testing. Are all critical."

Working with a team which genuinely understands the current requirements is essential. Security is not just a tick-box exercise and needs a dedicated team and project scope to ensure that the systems are robust, both individually and when operated in combination.

Security is also not a "one time" activity; every firmware release, every operating system change will change the attack surface of the system, so testing and retesting is the only sure way to minimize the threat.

"IoT security fits squarely in the gap between people skills."

The danger is that neither the contact team or the corporate IT deals with this and the organization leaves an open door for data theft or hacking.

"I would say 50% of the folks we speak to don't have the expertise to handle this. They don't have an in-house team or an educated contracting team support that. So often the networks are literally thrown in."

Does Smart cost more?

There is a cost to implement Smart, particularly when working with new teams, due to the learning curve as well as the infrastructure outlay. But if done correctly the return will significantly out way the investment.

"I think you'd probably spend three to four euros more on buying the kit and then running the software, but I think you get 10 euros back in benefit."

A genuine delivery of Smart will give at minimum, insight of your energy consumption. The opportunity is that once the ROI is paid back, you will continue to make savings. Additionally, you can then take that working design and commoditize it on subsequent buildings to multiply your savings.

The ability to self-learn systems, particularly around BACnet/IP and MQTT will significantly reduce implementation costs. Ideally, systems should present data natively at the device or at the edge allowing fully self-documenting data that can be simply ingested.

Who is best placed to deliver the outcome?

Who is best to manage the process delivery, systems integrators, master systems integrators, system provider or clients?

"They all have a scope. System providers are well positioned to write and engineer the plant strategy. SI are well positioned to normalize data. Clients and MSIs are well positioned to integrate the data and implement the use-cases."

The challenge is also the consistency of skill within the supply chain. Even the best companies have limited depth and breadth in their teams to handle multiple projects concurrently to the same standard.

"The issue is that every company has an A team and several B, so it is difficult to ensure the consistence of delivery."

Conclusions

Smart Buildings implementing numerous open technologies will become a regular feature of the built landscape. The challenge is to avoid, late or expensive delivery of these projects. This process needs to start from the Employers Requirements and then be fully detailed in the design specification. A strong leadership team should protect the vision throughout the delivery process to ensure that the outcomes are not diluted or diverted by the evolving agendas around, cost, time and functionality. Thorough testing of interfaces and interactions needs to happen early in the process to avoid unnecessary back-end delays or design compromises.

The industry needs to invest in training for the design and construction teams, as well as the building operators to ensure quality and consistency. In an era where data security is critical, the testing and verification process needs to be an ongoing requirement through construction into operation.

Given the initial investment by the industry, the aim should be to leverage the skills of experienced delivery partners to reduce implementation costs, whilst ensuring that the solutions deploy the best-in-class technologies.

The key is to start from the outcomes and work back to the technology.

My thanks to John, Matt, Ian, Linden, Kal and the Prolojik team for their contribution and insight. This will be a regular session to capture the evolution of the sector and introduce new viewpoints to the conversation.



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