



# Someone's Edge is Someone Else' Core: A case Study for the Delivery of Pacific Islands Data Centers

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AUSTRALIA  
30 August 2023

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## Someone's Edge, is Someone else's Core:

*Designing a Perfect Data Center Edge for the Pacific Islands*



*Quantum Computing DC prototype, CM+A*

One common mistake in building data centers (DC) in remote areas, such as in the Pacific Islands, is for the engineering team or future operator to propose a copy-paste design they are comfortable with, but that is oversized and half-baked. Another common oversight is with not understanding current and future power-to-site availability prior to launching into expensive engineering design. But mainly, what we are observing most is a failure of the engineering team to understand their client's *Business Case*; which to be fair, is more of a generalist, or traditional Architect's job.

### The "Build it and They will come" idea

As we personally witnessed in recent years, many white elephants were conceptually approved and built in regional areas, some in hope that demand or "rack-space" would eventually fill up; and they do, but way too slowly as it turns out. And so, this has turned into a serious reputational issue for new DC operators and their CEOs, who may have over-promised and under-delivered to their financiers and the public... We now know that most end-users are ok with 25ms latency to a primary DC located far away, so long as it is part of a larger ecosystem, like Sydney. So, with regards to any Pacific Island DC, this leaves us catering to a market of decentralize service providers with very specific needs; needs which impact on your infrastructure's final design, size, staging, and delivery method.

### One Size does not fit All

In designing a decentralized DC facility, or a business-park DC cluster, the Architect must lead the engineering team back to first principles. There is always resistance to do so by the team, however, no design should ever move forward without the Lead Architect having detailed understanding of the client's business case in the first instance.

*"A Lead Architects is a generalist who can understand the big picture and go to war daily for you, ensuring that your long-term requirements and vision will be delivered though the process of 100 engineers and sub-contractors, all chipping away at your end-product", claims Charles Fortin, Managing Director at Collard Maxwell Architects.*



So, with that in mind, it is critical for Engineering Design and documentation to be held back until key Financial, Reputational, and Executional risks are well understood and resolved within the Architectural concept design. This sequence is important in aligning the engineering team with your actual needs as a business. Failing to do so could see you develop a facility which is not appropriate for its location. Or worse yet, your capital might become tied up in an over-designed empty facility, while you wait several years for demand to grow.

### Focus on Context and Key Vulnerabilities

Pacific Island DCs are more vulnerable to certain constraints, compared to their mainland counterparts. In fact, we believe that more

resources must be allocated in resolving the following within the design:

1. Talent availability
2. Power availability, density, and stability
3. Disaster readiness, extreme weather
4. Environmental, ecological concerns
5. Transportation and logistics
6. Cooling and water resources
7. Dependencies to imports
8. Data regulations and sovereignty
9. Data redundancy, security and resilience



*Pacific Islands Cluster DCs, CM+A*

### Effectiveness of our 2N+1 Team Structure

Core design principles required for the successful operation of a mission critical facility are: *Resiliency, Flexibility, Redundancy, Low Latency, and Future-Proofing*. We found building a team on these same principles to be very effective. Further, TWO architectural firms, plus ONE engineering firm are allocated to each project, hence 2N+1. The formula is common to all engineers on the job, and structuring the entire design delivery team on this basis ensures that everyone is aligned, and that less errors are made.

Contractually, the most effective design delivery method is for an experienced Lead Architect to take on the role of Primary Lead Consultant, and to brief and engage all consultants on your behalf. This will provide one simple point of contact (for 2 architects) and a more linear process for you to audit, all while promoting transparency and unity of vision for the whole team.

We would advise against engaging a traditional Project Manager to lead engineering workshops. However, PM selection becomes easier once technical design is complete, and everyone gained

a better understanding of the project Cost, Timeline, and Quality. Surprisingly, the role of the PM in all our recent DC projects was either non-existent, or limited to reporting and processing progress claims for the client.



*Australia Regional DCs, CM+A*

### Building Long-Term Local Expertise is Essential

Local Knowledge and Expertise is your best asset. We believe that, because data centers in the Pacific Islands region must be maintained and upgraded too over time, that the right design delivery approach must be to reduce your reliability on international consultants and equipment as much as possible.

We know that more DCs will surface in other regional hubs once your primary facility is built. Therefore, we always stress the importance of establishing a transfer of knowledge strategy, such as our 2N+1 approach with a well-established architectural firm in your DC region. Such firm must demonstrate an above-average staff retention rate, with decade-long commitment to their industry.

In our case, we like to work with *Conway Architects* and their team, and we are confident that they will be able to manage on their own, once their local Pacific Islands ecosystem matures, and more data centres are added.

