Offis
MULTI-CLOUD SERVICES

Offis IT Infrastructure Maturity Model

Agile IT Infrastructure enabling innovation

P +61 2 9776 2300 | E franck.demoiseau@offis.com.au | 55 Pyrmont Bridge Road, Pyrmont, NSW 2009

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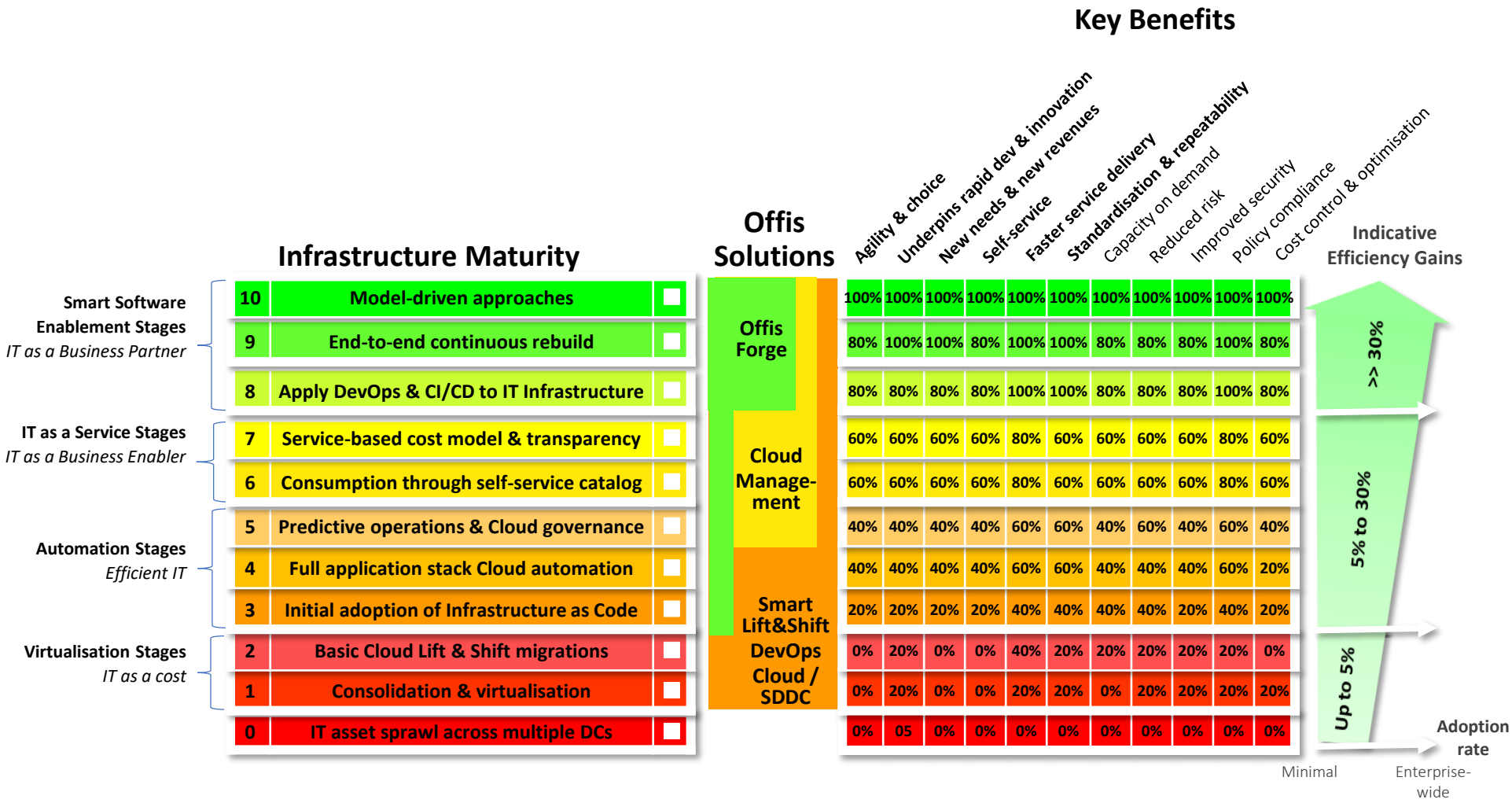

Which Stage of your IT Infrastructure journey are you at?

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The Start

Stage 0 Server sprawl across multiple DCs:

This is how most corporates start. Everything is done manually. Costs are high and any substantial change or new environment takes a long time. IT assets are scattered, inefficiently used, and managed manually, as “pets”. Obsolescence and technical debt rise to dangerous levels. Operational risk is high, with SLAs, RTOs and RPOs unable to be guaranteed. Furthermore, IT infrastructure creates massive inertia for the business, preventing agility and choice, crippling progress & innovation.

The Virtualisation Stages

Stage 1 Consolidation & virtualisation:

During Stage 1, reducing cost takes centre stage as the main priority. A mandate is issued to consolidate data centres & IT assets to reduce cost. IT asset utilisation increases through server consolidation and enterprise-wide virtualisation. However, new concerns arise, including VM sprawl, and a lack of automation, agility and self-service. Often shadow IT emerges, with LOBs using Public Cloud as a comparison reference point to apply pressure. To make matters worse, obsolescence and technical debt continue to grow within the VMs as these are still being managed as pets. LOBs begin to lose trust in the central IT function’s capability to assist the business, often viewing it as a hindrance.

Stage 2 Basic Cloud Lift & Shift migrations:

Stage 2 marks the start of a new Cloud mandate, typically more for internal political or perceived cost reduction reasons than for the core benefits of increasing automation and agility. A low maturity “lift & shift” foray into Cloud is usually elected, to relocate existing legacy VMs into one Public Cloud. Such initiatives have key technical limitations, providing none of the foundational benefits of Cloud the business must have (increasing automation & agility and reducing technical debt) and only work for a subset of applications. Furthermore, this typically increases cost. From here, disillusionment of Cloud may ensue, sometimes leading to reverse migrations of workloads from Public Cloud back to on-premises. Smart corporates will instead revise their Cloud strategy, going back to the drawing board to seek out the foundational benefits of Cloud, leading them to move up into the more mature automation Stages.

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The Automation Stages

Stage 3 Adopt Infrastructure as Code (IaC):

IaC elevates IT infrastructure to Software, providing the genuine paradigm shift needed to modernise IT infrastructure, underpin automation & agility, and reduce technical debt. IaC enables automation and Software management principles & disciplines to be applied to infrastructure, greatly increasing efficiency, repeatability, and agility. A challenge with Stage 3 is the required shift in thinking by IT infrastructure staff, who must learn to bridge the infrastructure / developer chasm to derive the benefits of IaC. Many IT infrastructure teams struggle to adapt to this new way of thinking and approach. Often, adoption is slow, patchy and painstaking; applied reactively and opportunistically to address specific pain areas, typically more around improving efficiency than improving maturity and agility. Teams build expertise and gradually change their mindset to transition from manually managing infrastructure, as “pets”, to using automation and treating infrastructure as “cattle” (stateless, ephemeral & transient). Sensible use of consultants to embed leadership & necessary skills is advisable to ensure the success of this fundamental transition.

Stage 4 Full application stack Cloud automation:

The successful adoption of IaC marks both a desire and an ability to use automation systematically, underpinning the essential capability to automate and orchestrate the creation of fully working application stacks from scratch, in real-time, as ephemeral workloads: from the network and security infrastructure, to the servers, O/S, databases, middleware, applications and data. Previously, it had not been possible to rebuild complex IT environments from scratch in less than days or weeks. But now, this new automation capability brings the speed and agility the business needs: environment of all types (Dev, Test / Prod), of variable complexity, and with the highest levels of security can be provisioned near-instantly, enabling real-time cost-effective delivery of automated cloud resources / services to LOB teams and developers, uplifting DevOps & CI/CD, and supporting agile Software development. Uplifting agility takes centre stage, and this will continue through to stage 10 (and beyond). Agility requires a multi-cloud strategy, so automation should not be limited to any single Cloud. This is the time to introduce a Cloud Management Platform (e.g. RightScale, Scalr, Cisco/Cliqr) to industrialise, homogenise and simplify the management and governance of workloads across a heterogeneous Cloud landscape.

Stage 5 Predictive operations & governance:

Governance is enforced through operational, cost, security, and compliance policies. A Cloud Management Platform is instrumental in enabling this. Manual operations are replaced by predictive automated operations. Automated actions are applied whenever specific criteria are met, enabling auto-scaling, self-healing, preventative maintenance, patching, etc.. Scarce infrastructure engineers, previously consumed by the day-to-day operations, can now be better utilised on higher value projects. SREs can focus on service functionality knowing that the underlying infrastructure is managed for them. Smart analytics and insights enable the real-time optimisation of live environments, including dynamically adapting resource levels depending on live workload requirements, tracking and terminating unattached volumes and runaway cloud instances, shutting down instances during evenings / weekends and restarting them on weekdays. This can reduce Cloud spend by 30-45%. Brokering across multiple Cloud providers unlocks even more savings through choice (Porter’s 5 Forces). Security is enforced proactively through policies, e.g. eliminating unsecured storage and open security groups.

The “IT as a Service” Stages

Stage 6 Consumption through self-service catalog:

The next step is for the IT Infrastructure team to leverage the automation capability gained during the automation stages, packaging this as relevant IT services for user consumption through a self-service portal (e.g. ServiceNow, Cherwell, BMC Remedy, etc.). The portal interfaces with a hybrid / multi-Cloud provisioner (RightScale, Terraform, Ansible) to provision the service. A constant user feedback loop ensures maximum service relevance. Examples of high-value services include developers self-provisioning development / test environments (saving days to weeks of elapsed time), help desk staff immediately restoring databases at the push of a button or instantly deploying the latest patch to a production environment, SREs performing a system upgrade seamlessly for their services / applications, developers releasing their own functional enhancements to production, the finance department allocating more resources to the ERP system to speed up reporting, etc.. Giving LOBs access to fundamental capabilities that will enable them to evolve business services in smart agile ways is a game-changer.

Stage 7 Service-based cost model & transparency:

The other important element to “IT as a Service” is to provide full upfront cost transparency and granularity for consuming these services. This has been a key factor in the success of Public Clouds. Only with cost transparency will the LOBs consume internal IT services readily and confidently. IT costs have typically been opaque, resulting in mistrust between LOBs and the IT infrastructure team, technical stagnation, shadow IT initiatives, and mounting inefficiencies & opportunity costs. Once service automation is completed (Stage 6), the marginal cost of creating a new unit is near-zero. However, other considerations including licensing and consumption costs must be priced in for full-cost awareness. Clear services, a transparent cost structure, and an effective charge back mechanism will give LOBs full confidence to consume services they understand and appreciate. Only then will IT stand a much better chance to provide a sustained competitive advantage and become a true partner to the business.

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The Smart Software Enablement Stages

Stage 8 Apply DevOps & CI/CD to IT Infrastructure:

The evolution of the IT infrastructure into a code base enables the smart DevOps, CI/CD, and code-generation techniques used by developers to be used with IT infrastructure. DevOps and CI/CD practices have enabled Software development to become agile, shortening timeframes and improving S/W quality through automated testing (non-regression testing, integration testing, performance testing). Applying the same best practices to IT infrastructure yields massive gains in efficiency & quality, enabling fast well-tested changes. What used to take months is now achievable in hours. The same version-controlled infrastructure code base is used for every environment, seamlessly across multiple private and / or public Clouds, eliminating configuration variance - the enemy of automation. Workload portability increases across Clouds, bringing choice. This level of IT infrastructure maturity brings far-reaching benefits, improving security, reducing risk, lowering cost and supporting new revenues. Thereafter, IT infrastructure is able to change at the speed of Software to support the endless needs of an evolving business.

Stage 9 End-to-end continuous rebuild:

Stage 9 marks the time when IT infrastructure teams leverage their full stack Cloud automation capability & mindset to institutionalise end-to-end continuous builds, across the board. As long as any infrastructure components are still being managed as pets (with layer upon layer of incremental changes applied adding complexity and obfuscating the exact state of these components), ITIL processes will struggle to mature, and automation & agility will be very limited. Gaps in IT infrastructure knowledge have arisen from managing infrastructure as pets and from staff turnover, impacting the ability to make effective changes, leading to inertia and obsolescence. The only real way forward is to start over and rebuild the entire corporate architecture end-to-end. Equally importantly, the way to stop this from happening again is to adopt a continuous rebuild mindset, consistently applying changes by doing regular full environment rebuilds. Automated agile infrastructure necessitates mastery of the configuration state of every component, which a “manufacturing-like” rebuild mindset enables: the environment automation blueprint becomes the manufacturing “mould” that enables the complete rebuild of the infrastructure & applications (the entire environment) to their latest configuration. Thereafter, any change is applied to the blueprint, not to the running components, and the blueprint rebuilds the infrastructure.

It is commonplace for Software developers to apply / recompile the full code base whenever they make changes. Now infrastructure engineers must join them in adopting a continuous rebuild mindset. This will reduce risk and cost, and provide huge agility and efficiency. It will also mature ITIL processes, enabling change version control, automated testing of changes, fully-automated releases, and environment cloning for incident resolution.

Stage 10 Model-driven approaches:

Agility comes at a price: it takes a very large codebase (typically hundreds of thousands of lines of code or more) to be able to provision into Clouds the multitude of permutations of infrastructure components, applications, services and datasets needed by the business. The benefits of this codebase are immense, but creating and maintaining it manually is challenging and expensive. A smart alternative is to use model-driven S/W generation tools to take away the burden of writing & maintaining code. With a model-driven approach the entire corporate architecture (infrastructure & apps) is configured as version-controlled metadata in an information model. From this metadata, the model manufactures the provisioning code for any required task, and then executes it. Subsequently, only the metadata in the model need change. The model becomes the new control centre for employees and AI to shape and mould the future of the enterprise in real-time, enabling the highest level of agility for maximum innovation.

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Would you like to increase your IT Infrastructure maturity and bring your business the agility and speed it needs to innovate?

Contact Offis at sales@offis.com.au

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