WHITE PAPER

Understanding Architecture: Architecture Principles

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The power of enterprise architecture is its ability to simplify complexity.

For Architects using TOGAF, this is achieved by using a set of building blocks, simplified and defined elements of design, which can be connected to produce a model of an organisation. The model can be analysed to understand the current situation and adjusted and extended to show options for future development. For the model to be effective, an Enterprise Architect must be familiar with the types of blocks, known as stereotypes, and insistent on clean thinking: when the definitions of the blocks are blurred or misunderstood, the analysis gets muddy, and the quality of the work suffers.

In this white paper, we will start to explore in detail the elements of an enterprise architecture that are of most use in large-scale digital transformation. The aim is to go beyond the dry and theoretical description of definitions provided in specification documents, and explore the more human side of enterprise architecture, discussing how psychology plays a part in the design of an enterprise, and how architecture can be used in practise to drive successful transformation. My hope is that this will enrich our understanding and help us to unlock the power of enterprise architecture.

This white paper will:

- Introduce the concept of Architecture Principles. First, we will identify the symptoms experienced by an organisation that does not have an appropriate set of Principles in place. Then, we will define the concept of an Architecture Principle, and explore the all-too-human reasons behind their usefulness.
- Outline the formal structure in which Principles should be written, and the consideration that must be given to their interaction.
- Discuss the use of Principles in the governance of an organisation. I will also provide and discuss a set of Principles that I have designed specifically to support the adoption and governance of platform-based operation within an enterprise and discuss each of them in turn.

Who is this white paper for?

The intended audience are enterprise architects, change consultants, and any one working on or concerned with planning and delivering successful digital transformation programmes. The term 'customer' will be used to refer either generally to the people being guided by the Architect/Consultant, or more specifically, to users of ServiceNow products.

Note from the Author: *While I have worked with many organisations, none of them will be directly referenced in this document. All examples will be genericised, and any resemblance to a real organisation is purely coincidental.*

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Symptoms

"Good Lord this is complicated," exclaimed John from IT Operations. "Why do we have so many applications?! There must be 57 ways of doing customer service in this crazy organisation."

"It's worse than you think..." chimed in Sam, a data consultant recently (and expensively) brought in to try and resolve the chaos. "Every department has a different way of recording case data. They all ask our customers for the same information, then store it in systems that don't talk to each other."

"I think I found a solution to that one," said John. "This new app I bought last week. I didn't ask anyone first, but the demo was so convincing..."

Sam shuddered. "Great. Now we have 58 ways to do it!"

It's easy to spot an enterprise that has no Principles. You'll find an ever-growing number of over customised IT resources that do not integrate; multiple platforms and applications with duplicated and overlapping functionality; staff drowning in e-mail; and an array of disconnected and manual processes. They will have an immature and ineffective Governance capability. Most telling, you will find that IT runs tactically, not strategically. Operational decisions will either be made on impulse or will take far too long, but in either case, they most likely won't support the wider strategic aims of the enterprise.

The Definition

TOGAF defines Architecture Principles as:

> *"A set of principles that relate to architecture work. They reflect a level of consensus across the enterprise and embody the spirit and thinking of existing enterprise principles. Architecture Principles govern the architecture process, affecting the development, maintenance, and use of the Enterprise Architecture."*

Why Architecture Principles are Useful

The official definition is true, but Architecture Principles are so much more: They are statements of intent which help to define the ethos and culture of an organisation. Effectively, they are decisions made in advance; they are the guardrails that keep an organisation true to its purpose. They protect an organisation from the whims and opinions of individuals and drive the organisation towards the agreed consensus. If an organisation finds itself in chaos, imposing a good set of Architecture Principles will serve to reduce complexity, and help to shepherd it towards order.

> Change your opinions, keep to your principles; change your leaves, keep intact your roots.
>
> **Victor Hugo**
> **French Novelist, Artist and Politician, 1802-1885**

There is nothing new under the sun. Without getting religious, possibly the oldest example of Architecture Principles in literature are the 10 Commandments given to Moses at Sinai. In this exquisitely concise list, we have a predefined set of rules that will be used to shape a rabble of escaped slaves into an ordered society. As written in the Old Testament, each commandment is a short phrase, pithy, and easily remembered. There are ten of them, so one's fingers can be conveniently used as an aide memoire. In addition, although the list is short, it covers all the bases of interactions between man and man, and man and God.

To draw the parallels in our own practise, Architecture Principles are created and approved high up in an organisation and then promulgated to lower levels. If you want them to be well adopted and used, the list of Principles should be short, no more than 20 or so for a whole enterprise. The set of Principles will be wide-ranging in scope covering, at a high level, the activities and intent of the organisation. Moreover, they will describe the interaction within an organisation, and with the wider enterprise, that is, with entities outside its own boundary.

There are further psychological insights that we can draw from the 10 Commandments. When Moses gives the 10 Commandments to the people, they accept them without question. If you have ever tried to impose an entirely new way of working on a large group of people, you'll know that on the face of it this sounds impossible. Surely, they would resist the change? Why would a group of people voluntarily accept a set of rules that appear to restrict their activities and curb their excesses? The answer lies in the way that the people behaved prior to receiving the Commandments: They had a moral code, observed through common agreement, it just hadn't been written down and formally established in law. They readily accepted the Commandments not because they were new, but because they were familiar; they reflected their own long-established ethos and aspirations.

To bring this back to earth and the reality of enterprise architecture, even within siloed and chaotic organisations there will be people who understand best practise. There may be policies that are being followed informally, even processes that support industry-standard working procedure. The knowledge is already there, it just hasn't been formalised. Creating Architecture Principles allows this best practise to be abstracted away from just the few individuals who know it, so that it can be adopted and upheld by the whole enterprise.

Although it can be difficult to craft a good, elegant set of principles, once finalised, they often seem like obvious rules that everyone should be following already. This is the mystery and power of Architecture Principles: They act as crystalised common sense, and when adopted and maintained through Governance, they work like a charm to bring order to chaos and align an enterprise with its strategy.

The Nature of Principles

While on the surface they appear to be basic, rational statements, Principles need to be selected with real care, so that they create a harmonious set. If not, they could clash with each other, leading to conflict between teams and slow decision making; or worse, they could work against the aims of the enterprise, and lead it down the wrong path.

> “Genius ain't anything more than elegant common sense.
>
> **Josh Billings (Henry Wheeler Shaw), American Humorist, 1818 – 1885**

Good Architecture Principles are persistent, enduring, and right almost all of the time. This lends them gravitas; they are solid and dependable. Their unchanging nature ensures that they have time to embed themselves into the culture of an organisation; they assume the mantle of accepted wisdom.

Paradoxically, the inherent flexibility of a Principle is also critical. Principles are not absolute, and there can be times when it is better *not* to follow them. To illustrate this, under normal circumstances, you would not want someone to come at you with a knife. However, if you are in hospital and suffering with a condition that requires urgent surgical intervention, you will be thinking differently.

Likewise, there will be times when Architecture Principles must be broken, for good reasons. This is perfectly acceptable, provided that the decision to go against the Principle is made under governance. So, in a high-security environment, a few IT assets might be kept deliberately disconnected from the internet, even if there are general Principles within the enterprise to use networked systems and have connected data.

If the Principles of an enterprise have been designed to support continuation of the status quo, exceptions (and sometimes revision) might be required during major digital transformation to enable a step-change to occur. For example, if a "Use Before Buy" Principle is in place, it may have to be suspended temporarily for legacy IT to be cleared out and replaced with more modern tools.

Types of Principle

The TOGAF specification discusses two types of Principle: Enterprise Principles and Architecture Principles.

- **Enterprise Principles** provide a basis for decision-making throughout an enterprise and inform how the organisation sets about fulfilling its mission. These help to harmonise decision-making across an organisation, and they are a key element in a successful Architecture Governance strategy.
- **Architecture Principles (the subject of this white paper)** are Principles that relate specifically to architecture work. They govern the architecture process, affecting the development, maintenance, and use of the Enterprise Architecture, and they can be considered a sub-set, or perhaps a specialisation, of the Enterprise Principles.

I'd be so bold as to include a third type, **Programme Principles**. For those of us engaged on large transformation programmes, it can be difficult to ensure that all the sub-projects are working in concert towards a common goal. If you are a consultant, and your customer has a set of Architecture Principles, then it ought to be adopted by default. However, if the customer has little or no maturity in their enterprise architecture capability, then agreeing a set of Architecture Principles specifically for the Programme (Programme Principles) will enable some level of governance to be applied to decisions at least within the scope of the work, and so improve the programme's chances of success.

> The Naming of Cats is a difficult matter,
>
> It isn't just one of your holiday games;
>
> You may think at first I'm as mad as a hatter
>
> When I tell you, a cat must have
>
> THREE DIFFERENT NAMES.

The Naming of Cats,
T. S. Eliot, US Born British Poet, 1888-1965

How to Write a Principle

When creating a Principle, there are five parts to consider: Name, Definition, Rationale, the Implications of obeying the Principle, and the Consequences of not obeying the Principle:

- **Name:** Each principle needs a short, pithy name. This is likely the way that people will refer to it, so it needs to be something easy to remember. For example 'Anytime, Anywhere,' 'Use Before Buy'
- **Definition:** A brief, unambiguous description of the meaning of the Principle
- **Rationale:** The reasoning for why the Principle is there, perhaps mentioning the business strategy that it supports. e.g., for a 'Minimal Customisation' Principle, the rationale might be 'To enable platforms and applications to be updated quickly and easily, without the need for bespoke integrations, or input from specialist consultants. This supports our 'Keep It Simple' strategy.'
- **Implications:** A statement of what positive things will arise as a result of obeying the Principle. You might also want to indicate how this Principle impacts on particular parts of the enterprise, and how it connects with other Principles. e.g., for 'Drive Compliance' the implications might be 'To ensure that audits can take place efficiently, and so that we continue to operate safely within the law. This is supported by the 'Useful Data' Principle, and wherever possible, metrics should be built into automated reports to monitor Compliance.'
- **Consequences of not obeying the Principle:** A statement of the negative things that will arise if the Principle is ignored. For 'Drive Compliance' this could be 'If we do not meet our expected levels of compliance with Regulation XYZ, then the company may face punitive fines, and individual employees may be held responsible by law enforcement.'

Building Your Set of Principles

Once you have a draft set of Principles, look them over, and ensure that they don't duplicate, overlap, or contradict each other. There should not be too many Principles; around twenty-five is a good size for an enterprise. Many more than that and the set will become unwieldy, and each one you add will reduce the value of the others. Cull the list if necessary, by removing or combining Principles, to make a manageable set.

Revise the text if needed and make it as concise and simple as possible; this is generally good practice, but is particularly important in international organisations and in global teams, where material may need to be translated into other languages.

Check the levelling of the Principles; they should all be about the same, and at a relatively high-level. If you find that one is running into technical minutia, then it is probably worth removing it from the list of Principles and instead incorporating the information into a policy document, where details can be properly elucidated.

Finally, see if you can group the Principles into themes. For example; Data, Performance, User Experience. This will make it easier for people who will use the Principles to identify the ones that are relevant to their concerns.

> "To define is to limit
>
> **The Picture of Dorian Gray, Oscar Wilde**

Most Importantly: Remember that Architecture is a Team Sport

To be useful, Enterprise Architecture cannot be the output of one mind; that way lies the metaphorical Ivory Tower. If you attempt to create a set of Principles on your own for an organisation, please do not be surprised if they are completely ignored.

To be accepted, Principles must represent the consensus view of the organisation. When people feel ownership of the Principles they will be more motivated to uphold them.

It is good to have this in mind when you are working with customers; as an architect, you can facilitate the development of Principles, bringing stakeholders together in workshops to craft them together. Often, the discussions in such sessions can uncover discrepancies in approach that have been hobbling an organisation for years. In cases like this, you can use the workshop to debate and resolve these issues, and negotiate a Principle that will drive the organisation towards excellence.

Blank Pages are Scary

Many of our customers are either new to the Now Platform, or they are expanding their use of it. Operating a software platform of any kind requires a different mindset to handling an IT landscape of standalone or networked applications. Data flow is the key to getting the most value; when data can be shared seamlessly across an enterprise-scale platform, reused by different packages and applications, and collated and reported easily, its power multiplies. The platform goes from being a series of useful point solutions to a single, powerful engine that can drive a business forward. Getting to this point, however, requires that key decisions are made in a way that is consistent with both the needs of the organisation and the platform; the organisation needs to create a set of Principles that it can uphold through Governance.

As any author knows, a blank page can be intimidating. For many people, just the thought of composing normal prose is enough of a challenge to invoke writer's block, but the problem is compounded when one is faced with creating something that must have formal structure. It's easier to write a postcard than a sonnet.

Creating Architecture Principles from scratch can be a challenge; it requires knowledge of business, technology, and architecture standards. The Principles have to be pitched at the right level: not so high that they become vague statements of intent ('We will be the best at everything'), and not so detailed that they are irrelevant in most cases ('We will use the AcmeFinance App when the customer returns a faulty product on Thursdays.')

When you are working on tight timescale, and you're faced with the task of creating Principles, there are two very good reasons to have a draft set as a starting point:

1. It is easier to edit than to create
2. People can more easily replicate 'good' when they know what it looks like

With this in mind, I have created a set of Principles for the use of those engaging on major digital transformation with ServiceNow.

The Set of Principles

Theme: Culture

P1: Drive Compliance

Explanation: The systems we use must help us to maintain legal, regulatory and safety compliance.

Rationale: We have to maintain compliance, and the systems we have should make this easier to achieve.

Recommended for: Organisations in highly regulated industries, such as oil and gas, and banking.

P2: Great Place to Work

Explanation: Changes will be made with a view to improving the day-to-day experience of staff and customers.

Rationale: A happy workforce is healthier, more motivated and more efficient, and a happy customer is more likely to return and recommend us to others.

Recommended for: Customer/User centric organisations, those who want to reduce staff turnover, and those who have or hope to attain a particular reputation for service quality

Theme: Experience

P3: Consumer-Grade Experience

Explanation: The applications that we use at work should provide a similar, high-quality user experience to the consumer-grade applications we use at home.

Rationale: Systems that provide intuitive, high-quality user interfaces and performance are more enjoyable to use and promote work efficiency.

Recommended for: Organisations wanting to improve performance and efficiency, particularly for those with a lot of staff working from home. (Works well with Principle P2.)

P4: Consistent Experience

Explanation: We will minimise training time and increase productivity by having familiar user interfaces.

Rationale: It is easier to use systems that are intuitive, familiar, and well organised.

Recommended for: Organisations using multiple ServiceNow products, or wishing to develop apps on the platform; also, those in which staff often transfer between locations and departments.

P5: Comprehensive Service Catalogue

Explanation: The services we offer will be made visible and accessible to the intended users.

Rationale: People can only use services that they know about and to which they have access.

Recommended for: Organisations seeking to use Employee Portal, encourage self-service, reduce the volume of support calls, and improve staff productivity.

P6: Multi-Channel Delivery

Explanation: We will prefer solutions that can deliver a service through many channels, such as voice, webchat, mobile, self-service.

Rationale: We have a diverse workforce, and a broad customer base, with people with different physical needs and a variety of ways of working. We want to accommodate their needs and provide appropriate ways for them to access services.

Recommended for: Everyone, particularly organisations with a workforce/customer base that is largely mobile and/or remote.

P7: Efficient Communications

Explanation: Our workflows should be designed to reduce the need for emails.

Rationale: Excessive email and rework takes time and adds little value.

Recommended for: Those wishing to optimise and automate processes, and review the ways in which communications and notifications are sent.

Theme: Performance

P8: Useful Data

Explanation: Data quality, accuracy, and completeness is essential if our systems are to be useful.

Rationale: Bad data gives bad results. We want our systems to support and enable good data management

Recommended for: Organisations seeking to use the CSDM/CMDB, and to improve their data management and mastery

P9: Connected Data

Explanation: Employee services will be decoupled from functional siloes; bringing together disparate sources to improve data governance and quality.

Rationale: Siloed data leads to high maintenance, inaccuracy, and duplication. We want data to be cross functional and connected. Employee services need to be decoupled from functional siloes.

Recommended for: Organisations wanting to use the CMDB to improve data quality and to share data across multiple products on the platform.

P10: Connected Systems

Explanation: We will prefer solutions that enable our systems to be closely integrated.

Rationale: Connected systems are better able to share data and are easier to discover and monitor.

Recommended for: Organisations seeking to rationalise their applications, reduce the cost and maintenance overheads of their application landscape, and to bring as much of their operations as possible onto the platform.

P11: Process Automation

Explanation: Wherever possible, we will engineer our processes so that they can be automated and will prefer systems that will enable automation.

Rationale: Process automation can reduce the amount of human effort required to deliver a service, so that more can be done for the same investment of human resource.

Recommended for: Those wishing to improve customer service, productivity and efficiency, and to reduce manual and repetitive work. (This pairs well with Value Stream Analysis, and with Principle P11.)

P12: Differentiated Capabilities

Explanation: The capabilities between business lines (especially similar ones such as Tax, Audit, Consulting, etc) will be clearly delineated and clearly aligned to organisational leadership.

Rationale: By having clear roles and responsibilities, we can ensure that the different capabilities to not duplicate each other's work unnecessarily.

Recommended for: Organisations who have, in the past, suffered from the effects of overlapping capabilities, such as duplication of effort, poor reporting lines, and conflicting process flows. Also, those wishing to restructure geographically, and possibly to divest or outsource capabilities.

P13: Information Flow

Explanation: Processes will be designed to enable data to flow seamlessly from end to end.

Rationale: Data powers our business, and enabling it to flow easily and securely through our processes will save time, effort and money.

Recommended for: Organisations who are developing their use of the CMDB so that they can improve their data quality, and share data between different parts of the Now Platform.

P14: Process Transparency

Explanation: Processes will be mapped and published for colleagues to see and share

Rationale: Our processes need to be easy to understand so that we can have trust and confidence in them.

Recommended for: Organisations building their Enterprise Architecture Capability, and using it to empower their staff. Making architecture comprehensible and visible, and encouraging people to comment on it, empowers the staff, and helps to drive continuous improvement.

P15: Anytime, Anywhere

Explanation: We will preferentially select systems that will provide access to services to colleagues anytime they need them, and anywhere they are.

Rationale: Our workforce is distributed, and many travel to customer sites in different regions and time zones.

Recommended for: All organisations with a significant remote workforce, or one in which staff frequently travel. This Principle has become particularly important in the wake of the Covid pandemic, which has resulted in a significant increase in home working.

P16: Pro-active Engagement

Explanation: User Interfaces and Services will be designed to encourage the pro-active engagement of colleagues and customers.

Rationale: People are empowered when they are able to address their needs quickly and easily. Self-service for simpler issues also frees up support staff to handle the more complex problems that may arise.

Recommended for: Organisations wanting to improve efficiency and staff satisfaction scores, and to reduce the load on call-centre support staff.

P17: Continuous Improvement

Explanation: Metrics will be gathered and analysed, and acted upon to enable continuous improvement of process and service delivery.

Rationale: With metrics we will be able to measure the impact of change and the quality of service delivery. Having this feedback will enable us to make informed decisions and continuous improvements.

Recommended for: All organisations. This Principle acts as a reminder to include metrics across the board, and to use their output to improve performance and to give praise when it is due.

P18: Drive Productivity

Explanation: We will seek to reduce process steps, enable self-service, and ease common tasks, to increase productivity to increase without increasing the human effort required.

Rationale: No one enjoys processes that take too long, and they take up time and energy that could be better spent elsewhere.

Recommended for: All organisations focussing on process improvement, and/or delivering Service Oriented Architecture. (Works well with Principles P11, P13 and P17.)

Theme: Program Approach

P19: Use Before Buy

Explanation: When applications are fit for purpose, we will make good use of them in preference to buying additional applications.

Rationale: We should make the most of our investments, and explore ways to use their full functionality, rather than buying additional software that makes our systems more difficult and expensive to manage and maintain.

Recommended for: Organisations that in the past have tended to proliferate applications, buying more without considering if they already had something that could do the job. (This is a good example of a Principle that may need to be temporarily suspended in order for major transformation to take place.)

P20: Adopt Not Adapt

Explanation: As far as possible, we will use applications out of the box, and avoid making customised or bespoke software.

Rationale: It is much easier to update a configured system than a customised one.

Recommended for: All organisations running the Now Platform; reducing customisation will result in faster, safer, and cheaper updates.

P21: Radical Transformation

Explanation: We will make bold decisions, encouraging 'radical transformation' beyond the limitations of the 'As Is' organisation / operating model.

Rationale: Sometimes a step-change is needed to make a significant difference. Considering the big picture can help to drive innovative and productive solutions that would otherwise be missed.

Recommended for: Organisations which have, in the past, made only small changes, looked for 'low-hanging fruit', and failed to change the status quo when given the chance. This is the most psychological of the Principles in this set; it effectively gives permission to leaders who might need a confidence boost, to encourage them to make the big decisions.

P22: Moments That Matter

Explanation: Workflows will be designed from a consumer perspective, across value chains, personas and user journeys to create 'moments that matter'.

Rationale: Every interaction that a human has with the system is important. A great experience builds trust, confidence and the reputation of the system and the company. A bad experience has the opposite effect.

Recommended for: Organisations with a "Customer First" focus, those seeking to deliver exceptional, perhaps bespoke, customer service.

Putting it into Practice

Organisations that do not have a set of Principles may consider adopting the whole set listed above, and adjusting them to fit their needs.

If an organisation already has a set of Principles, but they are only now moving to Platform operation, then their set will need to be adjusted to fit this new way of working. In this case, they can consider the set above in conjunction with their own set, and see if there are any of their old Principles that need to be removed or adjusted, and any new ones that can be included into their set.

In either case, if you are the EA or a consultant, you could take the list above and adopt a set of Principles that works for the organisation, and review in six months to see if the set is working well for them.

Used in combination with Governance, Architecture Principles are the best tool to shift an entire organisation into this mode of platform-oriented thinking. By positively influencing every design and buying decision, they help to shepherd the organisation away from chaos and towards order and discipline.

To be useful, the Principles must be used. This can be done though an Architecture Governance Board (AGB). Essentially, the Board adopts the Principles, and assesses all decisions against them.

The AGB could reject proposals that contravene the Principles, or they might, by exception, choose to suspend one or more of the Principles for a set time so that a necessary change can take place.

To extend visibility and utility of the Principles, an organisation may wish to communicate groups of them to relevant teams, so that they can be considered up front in planning, outside of the AGB meetings. For example, the team in charge of designing user interfaces might be given all of the Principles in the "Experience" Theme above (Principles P3-P7), so that they keep them front of mind throughout their creative process. In this way, the Principles can be taken out of the ivory tower of the Architecture Repository, and become embedded into the heart and culture of the organisation, exactly where they should be.

About the Author

Dr Michelle Supper has contributed to the creation of eight international standards, along with other publications including white papers and guides. She is the EMEA Enterprise Architecture Advisor at ServiceNow, in the EMEA EA Team, and the creator of the Guided Architecture methodology.

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