The Skilled Architect

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Architecture
Architecture is concerned with the creation of order out of chaos, a respect for organization, the manipulation of geometry, and the creation of a work in which aesthetics plays a far greater role than anything likely to be found in a humdrum building.

The Oxford Dictionary of Architecture
I call architecture frozen music.

Johann Wolfgang von Goethe
Architecture is the art of how to waste space.

Philip Johnson
Architecture: where the rubber meets the sky.

John Daniels
"Architecture" is a term that lots of people try to define, with little agreement. There are two common elements: One is the highest-level breakdown of a system into its parts; the other, decisions that are hard to change.

Martin Fowler
As a noun, design is the named (although sometimes unnameable) structure or behavior of a system whose presence resolves or contributes to the resolution of a force or forces on that system. A design thus represents one point in a potential decision space. A design may be singular (representing a leaf decision) or it may be collective (representing a set of other decisions).

As a verb, design is the activity of making such decisions. [...] 

All architecture is design but not all design is architecture. Architecture represents the significant design decisions that shape a system, where significant is measured by cost of change.

Grady Booch
- Architecture is reflected in and is a reflection of its surroundings
  - Architecture will influence and be influenced by team make up and style
  - Architecture will influence and be influenced by development process
  - Architecture will influence and be influenced by organisational culture
We shape our buildings, and afterwards our buildings shape us.

Winston Churchill
Architect
PART IV
USE OF TITLE "ARCHITECT"

20 Use of title "architect"

(1) A person shall not practise or carry on business under any name, style or title containing the word "architect" unless he is a person registered under this Act.

(2) Subsection (1) does not prevent any use of the designation "naval architect", "landscape architect" or "golf-course architect".

(3) Subsection (1) does not prevent a body corporate, firm or partnership from carrying on business under a name, style or title containing the word "architect" if—

(a) the business of the body corporate, firm or partnership so far as it relates to architecture is under the control and management of a registered person who does not act at the same time in a similar capacity for any other body corporate, firm or partnership; and

(b) in all premises where its business relating to architecture is carried on it is carried on by or under the supervision of a registered person.

(4) The Board may by rules provide that subsection (3) shall not apply in relation to a body corporate, firm or partnership unless it has provided to the Board such information necessary for determining whether that subsection applies as may be prescribed.

(5) A person enrolled on the list of visiting EEA architects may practise or carry on business under a name, style or title containing the word "architect" while visiting the United Kingdom without being a person registered under this Act during the period, and in respect of the services, for which his enrolment is effective.

(6) For the purposes of this section a person is not treated as not practising by reason only of his being in the employment of another person.

(7) In this section "business" includes any undertaking which is carried on for gain or reward or in the course of which services are provided otherwise than free of charge.

(8) Nothing in this section affects the validity of any building contract in customary form.
In the developed nations, the architect’s responsibility is to provide adequate blueprints, work with the construction firm to make sure they are understood, work with building inspectors to validate conformance to the blueprints, then make formal changes to the blueprints as new requirements are identified and as construction problems are discovered. No shortcuts in this workflow would be excused or accepted.

This analogy applies precisely to software architecture…

Richard A Demers
In software, the role of the architect spans many concerns
  - Technical and non-technical
  - Big picture to code detail

The role may be a job or it may be an additional role
  - It may be exclusive and appointed or shared and emergent
The difference between a good and a poor architect is that the poor architect succumbs to every temptation and the good one resists it.

Ludwig Wittgenstein
An architect needs to be able to have and pursue a vision

- An architect needs to be able to have, pursue, communicate, coordinate and adapt a vision of an architecture
- An architect needs to be able to differentiate between significant and less significant decisions
Knowledge
- Architects need a solid technical background
  - Code, tests, APIs, tools, techniques, modelling, patterns, etc.
  - This background also needs to extend into the present — it can't just be history
- And the rapid appreciation of unfamiliar technologies
  - Appreciation, not necessarily expertise
The Dreyfus model of skill acquisition defines different experience levels:
- Novice
- Advanced Beginner
- Competent
- Proficient
- Expert

Characteristics at each level differ...
<table>
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<tr>
<th>Skill Level</th>
<th>Mental Function</th>
<th>Novice</th>
<th>Competent</th>
<th>Proficient</th>
<th>Expert</th>
<th>Master</th>
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<tr>
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<td>Analytical</td>
<td>Intuitive</td>
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<tr>
<td>Awareness</td>
<td>Monitoring</td>
<td>Monitoring</td>
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<td>Absorbed</td>
</tr>
</tbody>
</table>
- Architects need to be able to live with a certain amount of ambiguity
  - Expert knowledge is contextual
- Uncertainty can be used as a driver in development
  - Deferring decisions to the last responsible moment
  - Partitioning according to stability, risk and uncertainty
The following approaches may improve performance...

- Multithreading
- Replication of data
- Reference-counted resources
- Automatic tracing garbage collection
- Choice of data structure
- Choice of algorithm
- Distribution
The following approaches may worsen performance...

- Multithreading
- Replication of data
- Reference-counted resources
- Automatic tracing garbage collection
- Choice of data structure
- Choice of algorithm
- Distribution
Architects need to be rational and empirical in their approach
- Able to reason, speculate, prioritise and look for evidence
- This complements the intuitive aspect
- Question assumptions, habits and analogies
  - Look for contradictions and support
Communication
- A great deal of architectural knowledge is based on experience
  - Absorbed, connected knowledge driven intuitively and contextually
- But there is also a need to make this knowledge explicit
  - An architecture and its rationale need to be communicated — they're no good as secrets
- Architects need to be skilled in communication
  - With both people and code
- Architects represent a bridge
  - Between the technical and non-technical, between different stakeholders and concerns, between the past and the future
Appropriate communication comes in many forms

- Models, visual or otherwise
- Workshops for modelling
- Patterns as vocabulary
- Tests to reflect concerns and requirements
- Documentation as a consumable
- Online and offline media
A given model will emphasise one perspective at the expense of others
- Good abstraction omits irrelevant detail
- Poor abstraction omits necessary detail or retains unnecessary detail

The identification of (in)appropriate detail is the key to effective models
Here is another liability: beautiful drawings can become ends in themselves. Often, if the drawing deceives, it is not only the viewer who is enchanted but also the maker, who is the victim of his own artifice. Alberti understood this danger and pointed out that architects should not try to imitate painters and produce lifelike drawings. The purpose of architectural drawings, according to him, was merely to illustrate the relationship of the various parts... Alberti understood, as many architects of today do not, that the rules of drawing and the rules of building are not one and the same, and mastery of the former does not ensure success in the latter.

Witold Rybczynski
Design
To say of a design 'it works, it does its job', or 'it gets its intended result' no more commends or excuses it than to say of a man 'he has never actually defrauded anybody'. That is not what virtue means! Something more is required.

David Pye
- Design is an intentional and creational act
  - Creation on purpose for a purpose
- Effective design is about more than just meeting functional objectives
  - Meet the stated objectives with care for the economic and daily interests of developers, users and other stakeholders
- Look for and respond to feedback
  - Review, revise and refactor
- Development practices need to minimise accidental complexity
  - Improve communication and intention of code
- Avoid design by superstition, blind imitation and unquestioned habits
Don't ever invite a vampire into your house, you silly boy. It renders you powerless.
That which is overdesigned, too highly specific, anticipates outcome; the anticipation of outcome guarantees, if not failure, the absence of grace.

William Gibson
Summary
An architect needs a wide-ranging toolbox of know-how to draw from

- Architects need many skills, not least of which is to know how much they know and how much they need to know to work effectively

- Architects need to be have trust and communication on their side
  - From technical credibility to humility