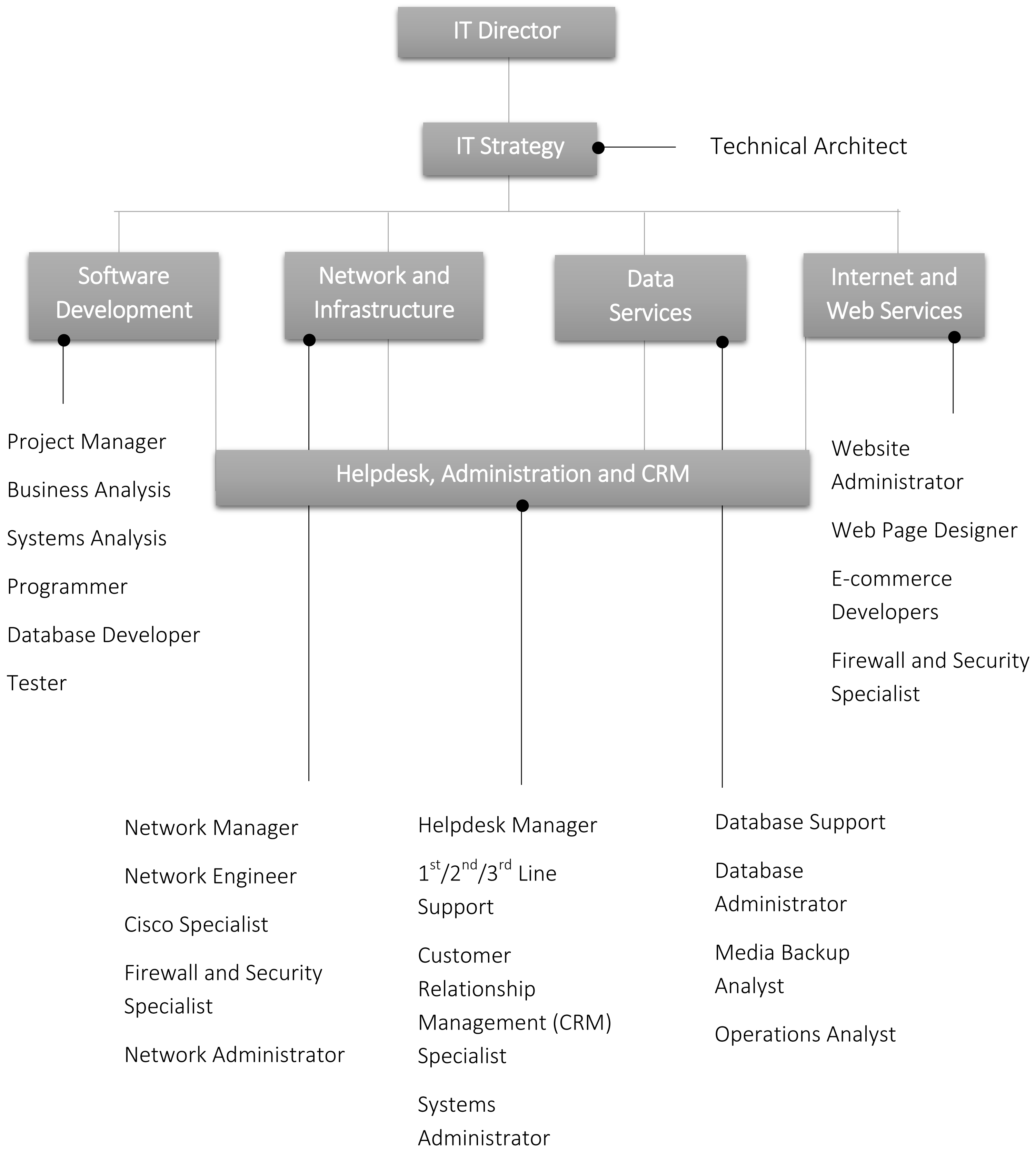
# A SIMPLE IT MODEL

MADE BY

tap.talent

## 1. How It Roles Fit into IT Department Today

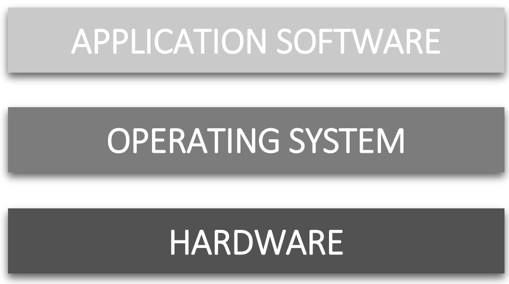


## 2. Introduction

Before we start delving into the complexities of each key IT role, it’s worth getting to grips with a few fundamental IT concepts in lay terms so as to build that solid foundations; as that’s what this chapter is all about. The knowledge you gain here will help you better understand the terms and concepts you’ll came across on CVs and job specs.

## 3. Sweet and Sticky: The IT Layer Cake

At the simplest level we can think of any company's IT system as being constructed somewhat like a three-layered sponge cake!



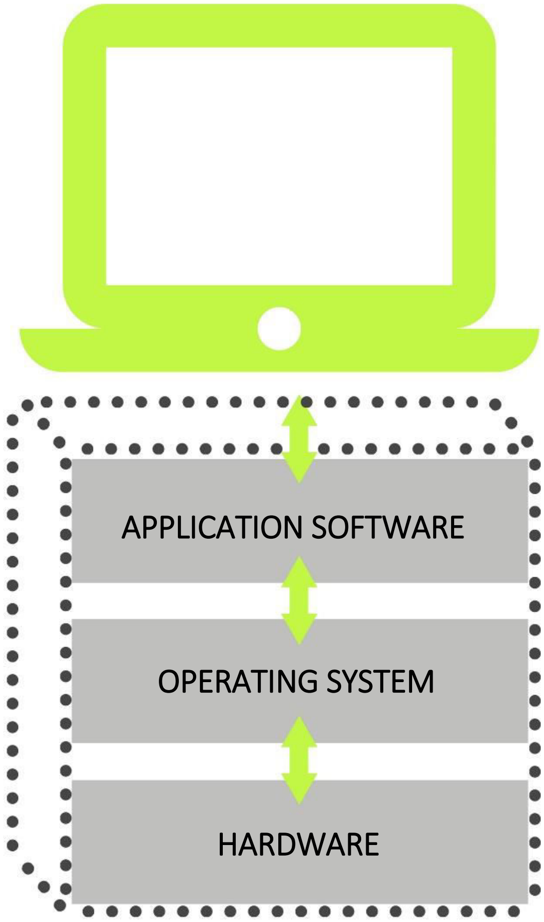

Regardless of whether the IT system in discussion is a single PC, a corporate level IBM mainframe, a Nokia mobile phone, a satellite in orbit around the earth, or the fly-by-wire system controlling the aileron and rudder movements of an Airbus aeroplane — the above three layer model generally holds true.

IT systems (generally) are made up of

- A topping of Application Software sitting on
- A central layer of Operating System (OS) which sits on
- A bed of Hardware

It's almost impossible to be living in the 21st Century (let alone be involved in IT recruitment) and not harbour some misconceptions about many of the above terms. So let's assume for the moment that we really are starting with a clean slate and define everything clearly. The simple concepts introduced in our layer cake analogy are summarized in the diagram on next page.

## 4. Basic Software and Hardware Concepts




### Application Software

All the useful business tools such as word processors, accountancy software and web design packages. Also games and entertainment software. These are presented to the user via 'peripheral' hardware such as keyboard, mouse and monitor (these peripherals are also controlled by the Operating System).

### Operating System

Brings the hardware to life and establishes a 'platform' to allow useful application software to run on the hardware. Also enables peripheral devices (mouse, keyboard, monitor) to work.

### Hardware

Includes the computer's motherboard, hard-drive, mouse, keyboard and monitor.

## 5. Layer I : Hardware

In a sense this layer of our IT model is the easiest to define.

- Hardware exists physically — it's not an abstract concept (which some might say of software). PCs, laptops and PDAs are what most people perceive to be 'the IT in their lives'. But of course they are simply referring to the external embodiment of IT. There is a lot more going on underneath the surface.
- Secondly, IT hardware is all around us and seldom a day goes by where we haven't bumped into a computing device of some sort; be it a PC, laptop, iPod, PDA, mobile phone or even the satellite navigation system in your car. Hardware is all around us.

Hardware, however, is useless on its own and would be but a meaningless collection of dead components without the **operating system** to breath life into it, and control its every heartbeat (chipbeat?). Furthermore, those bottom two layers of IT (hardware and OS) would be no fun at all without the application software which brings about all of the true functionality which we associate with our computers. When we walk into PC World, the shelves are stacked with a range of intriguing application software pleading with us to take them home and start designing our new landscaped garden, retrace our family history, or drive up to the Lake District using the shortest possible route.

- Categorising Hardware

Let's look at some key classes of hardware in more detail by understanding that IT hardware falls into one of the following categories:

<u>Mainframes</u>

The history Of these was outlined earlier in Chapter I . They are the large and expensive computers which corporations rely on to run their networks. They can support hundreds or even thousands of user machines (clients) on a given network and are the centre of IT focus for most large businesses. The company associated with mainframes from the dawn of modern IT is **International Business Machines (IBM)** though many other organisations also produce mainframe-type hardware.

<u>Supercomputers</u>

These are less talked about in business circles, although they are often more powerful in processing terms than their mainframe counterparts. The reason for this is that, whereas mainframes are the heart of a network of hundreds of business users and can accommodate many users working with many different applications at the same time; supercomputers generally dedicate all of their processing power to a single yet immensely complex task.

A prime example would be the supercomputer used by the British Meteorological Office to forecast global weather patterns. This requires all of the huge processing power of a supercomputer focused solely on an incredibly complex set of mathematical calculations. Other examples are the use of supercomputers to create the ever more impressive animations and special effects (otherwise know as **CGI — Computer Generated Imagery)** seen Hollywood blockbusters such as in the recent Star Wars trilogy, the Transformers movie, or in any of the Disney-Pixar animations.

Personal Computers (PC)

The emergence of PCs and Macs was discussed in detail in Chapter 2. These are of course the epitome of consumer driven IT devices and the Showrooms and shelves of your local PC retailer are testament to the success of this breed of hardware. When used as the end-user device in a network, they are often referred to as **fat** or **thick clients** within a **client-server** architecture. This whole concept is discussed in detail in Chapter 2.

Network Computers

A **Network Computer** or **NC** is again a particular type of **client** machine used within a client-server architecture, and was discussed in detail in Chapter 2 They are also referred to as **thin clients** because they have no hard drive (so the user is unable to store data on their own machine), and have minimal processing (so users can't introduce their own software or customise their own machines). The issuing of NCS was an attempt by businesses in the mid-to-late 1 990s to re-capture power for the IT department and restore higher levels of control and discipline over users who had started to run amok with the powerful PCs they were issued with in the early 1990s. In Europe **Citrix** is a company which will appear time and again on the CVs of your candidates who claim to be specialists in 'thin' client server architecture. Citrix specialise in introducing this type of network to your clients, though there are a myriad of companies to choose from if your business decides to go thin. This whole scenario is described as a major transitional episode in the evolution of IT on page 35.

Clusters

Take a situation where data and applications have to be available to all users in a robust and timely manner, without fail. The most effective way of achieving this high availability and security is by setting up two or more servers (often mainframes), or a **cluster**, housing the same data and applications. The group of servers can be connected together and keep each other updated as to the state of things. This enables the workload to be spread and allows ease of administration and maintenance.

Blade Servers

Blade server technology is one which allows the processing power of an entire mainframe server to be housed in a slim self-contained unit (known as a blade enclosure). A single blade enclosure has all of the necessary components relating to power, cooling, storage etc., but all are enclosed in a compact layer of hardware just a few inches thick (with the overall dimensions of say a large attaché case). The neat thing is that blades offer a **modular** approach to increasing your server capacity. This means that as your IT needs increase there is no need to buy an expensive new server, you can simply add additional blades, so that ultimately you end up with a large cabinet full of compacts 'slices' of . server, much like a giant vertical box of technology-flavoured After Eight mints.

Grid Computing

Grid computing is a very neat hardware concept which treats many separate and **heterogeneous** (described on page 162) IT systems as one coordinated pool of potential IT power.

In this way large computational problems can be solved by drawing on all of the disparate systems and focusing their attention on a single challenge. A good example of this is the 'SETI@home' project. **SETI** (Search for Extra Terrestrial Intelligence) is the project to find signs of life in outer space, but even their supercomputer isn't powerful enough to single-handedly analyse all of the data that pours in from around the world's radio telescopes. So they have created a grid computing capability that allows you, the humble user at home, to directly help them in their search, utilising the spare capacity of your home PC. Once you download their software and install it on your PC — it then becomes a part of the grid! Whenever you're away from your PC, i.e. making a cup of tea or on your lunch break, the SETI supercomputer will tap into your PC's idle time. So your humble machine rather then going to sleep and displaying some boring screen-saver, can divert its effort to the very important task of helping find E.T!

The Software Layers

So let's turn our attention to layers 2 and 3; the software layers of our IT cake Continuing with the theme of simplicity for a bit longer, here's some more good news; there are really only two big categories of software which you need be concerned about. Just two. Sounds easy enough I'm sure you'll agree. These are:

- Operating Systems (Systems Software)
- Application Software

However, you might want to hold on tightly to that feeling of lucidity for a minute, as I'm pretty sure you might need it later on. Nothing in IT is that simple. It probably won't surprise you to learn that these two classes of software can also be broken down into further sub-categories.

With that in mind, let's wade out a little further and explore these facets of software in more detail.

## 6. Layer 2: Operating Systems

Operating systems can be separated into two important groupings. Operating systems fall into those:

- From the Unix family (and which are said to be 'open') and
- Those which are non-Unix (and said to be proprietary or 'closed')

To understand this whole area of operating systems we require a complete section of the book, and so this concept is covered in much more detail in next chapters.

## 7. Layer 3: Application Software

Similarly, application software can also be broken down into further classes of software which generally fall into

- Off-the-shelf (OTS) software
- Enterprise Resource Planning software
- Middleware

And these distinctions also need to be understood fully if we are to converse with programmers with any level of confidence. This is a huge topic to which we'll dedicate an entire section of the book. Chapters 13 to 19 are all about Software Development.

## 8. Summary

For some of you it may be have been an insultingly simple chapter (in which case, not to worry, the limbering up session is almost over), as we have the juicy stuff on its way). For the rest of you, your first few teetering steps towards IT recruitment fluency are over, maybe it's time to get your water wings on, and paddle out a bit further into the deep end. Make no mistake about, 'The Guide' from this point onwards starts grappling with the real issues of IT recruitment. Acronyms and concepts are going to start flying around thick and fast. But no need to worry, as ever, we will keep it light-hearted and fun.

After all, 'The Guide' is forever patient, forever understanding!

Let's take a closer look at operating systems.

## 9. GEEK HUMOUR

Two rather nerdy programming students were walking across campus when one said, "Where did you get such a great bike?"

The second student replied, "Well, I was walking along yesterday minding my own business when a beautiful woman rode up on this bike. She threw the bike to the ground, took off all her clothes and said, 'Take what you want."'

The first programmer nodded approvingly, "Good choice. *The clothes probably wouldn't have fit.*"