Have you tried turning it off and on again? – Troubleshooting basics

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Abstract

Technology. Can't live with it, can't live without it. It's all around us, and it constantly goes wrong. In this talk I'll give you the basics of how to troubleshoot (aka working out what the problem is, and/or fixing the problem), ensuring that you spend more time doing interesting work, and less time cursing. This is a very useful skill for anyone who deals with technology, especially if they also deal with the general public, e.g. public library librarians. It isn't hard, and you should learn it, and mostly you can't make things worse.

Peppered with irrelevant references (e.g. 'PC LOAD LETTER' and 'Have you tried turning it off and on again?') it is hoped that this presentation is at least slightly amusing.

Introduction

This document is the body of the talk that I provided at the New Librarian's Symposium 9 in Adelaide in July 2019. It includes references and additional notes for those who are curious. It also contains some extra material that didn't make it into the talk.

It is intended to give you the confidence to be able to deal with technology.

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<slide>intro
Welcome to "Have you tried turning it off and on again" - Troubleshooting basics.
<slide>xkcd troubleshooting[1]
This talk is meant to take about 20 minutes, but I realised that actually most of it can be summed up in one diagram. The one on the screen.
<pause 1>
Copies are at the front. That's it. Let's go to the pub.
<pause 2>
Oh, you actually still want to me talk? Oh. OK. Let's do it then.

<slide>def.
Troubleshooting is "a logical, systematic search for the source of a problem in order to solve it, and make the product or process operational again".[2]
In other words it's all about finding a problem, and fixing it. We'll turn you into little Bob the Builders in no time[3].

<slide>Parts
The rest of this talk has three parts. In the first I'll go through a process that I want you to internalise when you are dealing with technology. Whether that's a computer, printer, microwave, car, or anything else really.

In the second part I'll give some specific troubleshooting steps that are very often useful. Finally I'll give some examples of how the process can be used.

<slide>Process
Now, on with the show. This process is basically what I do when troubleshooting. It's based on years of experience and reading. There's no magic to it, and anyone can learn it.

So, you've got an issue with some sort of technology, what should you do?

<slide>don't panic
The first thing to do is, don't panic. Panic will not make things better, and it may make things worse. Even if it's a life and death situation, it won't help.

<slide>Look, read, examine
The next is, always know where your towel is. A towel has great practical value. You can lie on it at the beach, you can cover your face ...[4]
<pause>
Hang on a minute, I think I got my notes mixed up.
<rustle papers>
Ah, sorry, here we go.

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1   Tech Support Cheat Sheet https://xkcd.com/627, by Randall Munroe, License: Creative Commons Attribution-NonCommercial 2.5 License.
2   https://en.wikipedia.org/w/index.php?title=Troubleshooting&oldid=882392476 accessed 2019-04-09
3   Bob the builder, can we fix it, bob the builder, yes we can...
4   H2G2, by Douglas Adams, of course. He was taken from us much too young, and I would suggest all of his other works, including *The Long Dark Tea-Time of the Soul*. Of course, I'm not exactly quoting, but frankly, I don't care.

The next action is look, read and examine. Look at the thing you are troubleshooting. Read any error messages; indeed, read everything. Examine any lights: flashing, red, or otherwise. So much troubleshooting can be boiled down to "do what the technology is telling you to do".
Reading, in this step, includes reading any error messages, dialogue boxes, and similar that may pop up on your screen. Do *not* automatically click OK, or the x in the corner. Stop. Read[5].

<slide>Do.
Then, do what you are told. If the printer says it is out of paper, then put some in the appropriate place. If it says "PC LOAD LETTER", then take it out to a field, and beat it with a baseball bat.[6]

<slide>Still from Office Space. [7]
<pause 2>

<slide>think
Of course, sometimes the solution isn't obvious, so you can't do what you are told. Sometimes you have to think. I know, I know, no one goes into library science to *think*. But, in this modern day and age, sometimes it's necessary.

Think, what was happening just before the issue occurred? What has changed?
Now, be careful here. If you are troubleshooting on behalf of someone else, you can't actually believe a word they say. There is a saying in IT, "users lie". Of course, that doesn't mean that users lie all the time. Or even that the user even realises the miss-truth they are saying. The point is that you can't trust what most people tell you when it comes to technology. Because they don't know what is important, and what isn't. They don't know what they don't know; sort of like Donald Rumsfeld[8]. <pause> The smeg head[9]. <pause>
Anyway, if something has changed, can you change it back? Does that fix the issue?

<slide>try
Now you've had a good think about it, try your solution. Does it work? Yes? Excellent. No? Well, go back to think.
Been doing this too long? In some cases you might want to only spend a couple of minutes at "think".
At this time you can also try the specific steps I list later, if applicable.

<slide>RTFM

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5   I was going to have "Stop. Hammertime." here, but I thought it seemed too forced. Not to mention I've never actually listened to the song from start to finish that I know of.
6   Office Space movie 1999
7   Cropped still from the 1999 movie Office Space, from the "printer scene". Taken from <<u>https://www.youtube.com/watch?v=N9wsjroVlu8</u>>. In Australia, this is a non-substantial part of the whole (is not an important, essential or distinctive part of the movie on its own), and thus is freely usable. See Australian Copyright Council information sheet "Quotes & Extracts", G034v12.
    <<u>http://www.copyright.org.au/acc_prod/ACC/Information_Sheets/Quotes___Extracts.aspx?WebsiteKey=8a471e74-3f78-4994-9023-316f0ecef4ef</u>>
8   To be fair to Donald Rumsfield, known knowns, known unknowns, and unknown unknowns can actually be a tool for managing risk, etc. However, to be honest he was also one of the warmongering so and sos...
9   Red Dwarf.

At some point, you really should read the fine manual[10]. People write manuals and help text for a reason. They often even have specific troubleshooting advice. Maybe try it? Does it help? If not, then ...

<slide>Get help
Get help. Once you've spent more than about 10 to 30 minutes on something, you'll probably want to get some help. That might be ask a colleague for ideas or assistance. It might be ask the Internet. You can't do everything on your own, and you can't have every possible thing in your head.

<slide>Give up.
Sometimes it all just gets too hard. Sometimes you've just spent 40 minutes banging your head on a brick wall, and have nothing to show for it. The client left 38 minutes ago – probably swearing about how slow and incompetent you are not having a magic fix in 30 seconds – and no one cares. Except you. Well, stop caring. It doesn't matter. Nothing matters.[11] And no one is going to die if you can't fix this issue – and if they might then, then you probably have people who can help and to whom you can pass the entire issue to. So give up.

Sometimes you can't fix it. If the item you are trying to troubleshoot has released its magic smoke[12], it's probably not something you can fix. Give up. If you've tried all the options and nothing has worked, give up. For example, when trying to fix an eresource access issue, I tried a few different things, tried accessing on different computers, and nothing worked. After having fiddled and faddled, I, gave up. I emailed my colleague, explained what I'd done, and that nothing worked. I informed the client and provided alternative resources.

Sometimes "computer says NO"[13], and you can't do anything else.

<slide>Rethink.
Of course, sometimes after you've given up, a different solution will spring to mind. That's OK. If the issue is still relevant, then go and try out your new solution. If it works, great.

<slide>specific steps
Right, that's the process. With these nine actions, anyone can troubleshoot anything. By the way, does anyone know anything about cars? I have this strange rattling sound in mine...

Anyway, on to specific steps you can try for certain things. As I said earlier, you can use these, if applicable, at the try stage.

<slide>is it plugged in? is it turned on?
Many technical issues can be solved with two simple checks. Is it plugged in? Is it turned on? This should be an automatic check when you are troubleshooting technology. If the thing is not even on, then maybe that is the problem.

Of course, as I said before, users lie. As such, you have to actually double-check these things. For example, a user may press the button on their monitor, and say that they have turned the computer on or off, not realising that they don't have an all-in-one.

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10 The 'F' in 'RTFM' actually means something else.
11 We all die alone. - This was removed from the main body of the talk on advice from the initial practice audience.
12 See https://en.wikipedia.org/wiki/Magic_smoke and http://www.catb.org/jargon/html/M/magic-smoke.html
13 Little Britain

As such, there are tricks you can use. Such as for cables, "swap the ends around". Or "blow the dust out of each end". This gets the user (if you're not there) to hopefully actually unplug and replug the cable.

Is it turned on? that's not always as obvious as you might think though. Check for lights, check for sounds (for example fans whirring), and check for other signs of life. It's possible that a computer can be making noises, but not displaying anything. This might mean you have a more advanced issue than is covered by my process, but stay at it anyway for a bit longer.

And is it plugged in means, is it plugged in at both ends? Are *all* the relevant things plugged in? You don't want to be like the person who said "yes, the monitor is plugged in" and was looking at it being plugged into a powerboard. Which was plugged into nothing, or worse into itself.
<slide> picture of powerboard plugged into itself.
<pause 2>

Alternatively, the monitor was plugged into the power, but the HDMI or VGA cable wasn't plugged in.

You also have to watch out for Quantum USB ports.[14]
<have a USB flashdrive; demonstrate this while talking>
Try to plug it in, turn it around, try again, turn it around, try and it works?![15]

<slide>Have you tried turning it off and on again.
Have you tried turning it off and on again? There is a reason this is a cliché. Often a simple reboot will be a five minute fix. It probably won't solve the underlying problem, but five minutes when you've got deadline yesterday, or a client breathing down your neck is a lot better than fifty minutes to do it right. And by the time you get around to rebooting ten times, it might actually be someone else's problem[16].

<slide>change a variable
Sometimes the problem is not what you think it might be. Sometimes it is worth changing a variable to see if that works.

If you can't connect to the Internet, try another web browser. If one web browser works, but the other doesn't it is valuable information. Or try another computer or device.
And if you can't print, try printing to another printer or from another program. If you can print to one printer, but not another, then maybe there is something wrong with the first printer. If you can print from one program, but not another, then you've narrowed down where the problem might be.

<slide>Ask other people if they're having the same issue
Asking other people if they are experiencing the same problem can also be very helpful. If lots of people are having issues connecting to the Internet, then it's probably out of your control to fix. If only you can't print, then maybe check your cables etc.

<slide>Write it down.

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14 See also <https://www.smbc-comics.com/?id=2388>, from 2011. See also
    <https://old.reddit.com/r/funny/comments/1s9754/quantum_physics_explains_usb_behavior/>.
15 This meme is becoming obsolete with the spread of USB-C. *sad face*
16 Alternatively, you could just invest in a someone else's problem field.

Regardless of what you've tried or haven't, it can be good practice to write down what has and hasn't worked. This way, you'll not only be able to report to your IT helpdesk what you've tried if you can't get the thing fixed, you'll have a record of what works and what doesn't, if you get the same problem or similar again. You can also share this knowledge with your colleagues.

<slide>examples
Now I've gone through the process and specific steps, I thought it's time for a bit of a pause. How about a joke? I would tell you a joke about UDP, but I'm not sure you'd get it[17]. Instead,
<slide>10
there are 10 types of people in the world, those who understand binary, and those who don't[18]. Ahem.

<slide>photo of MFD complaining about size
So this is a photo of an error that the MFDs at my work throw up on a tediously regular basis. Many people seeing this error say "the printer is out of paper". But let's go through the process.
The first action is "don't panic". No one is panicking right? Good. Now, look, read and examine. What does it say? It's got some small print at the top. That's important, let's look closer.

<slide>Zoomed in MFD
Oh, the answer is obvious, we have to tell the printer at what size we want the copy on, by selecting the relevant paper tray. We do that, the printer is happy, and we are happy having troubleshooted the issue. We don't have to even think. In this case, someone probably tried to copy a passport, which is A5 size, and as the machine isn't smart enough to just copy to A4, it throws up this error.

<slide>PC Load letter[19]
I mentioned earlier about if you get a "PC Load Letter" error, go and beat the printer in a field. This error message occurred on some older printers, and is particularly unhelpful if you haven't encountered it before. So, let's quickly go through the first part of the process, don't panic, look, etc., not so helpful, and so on. At some point you'll get to read the fine manual. Hopefully the fine manual will explain what that error code means. If it doesn't, then get help. In this case, a quick web search should tell you the answer.

The problem is that the printer has not got any 'letter' sized paper. The solution is to "load" some "letter" sized paper into the "PC", which in this case stands for "paper cassette". Particularly aggravating if you only have A4 paper, but your software defaults to wanting to print to "letter" size.

<slide>dash light in car
How about a different sort of technology? I bought a car a few years ago. One day, soon after buying it, I noticed a strange light on the dash that said "SPORT". I didn't know what it was, and I'm certainly not very sporty. As I was driving at the time, it was a little concerning. Luckily I didn't panic and crash. There wasn't really much more than the light, so 'look, read & examine' didn't help. Nor did 'do'. I tried 'try' and 'think', including pressing various switches, buttons and leavers near the

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17 UDP being a protocol that doesn't require confirmation of receipt of messages, and doesn't send things twice. So not sure the message would be received ("get it"). C.f. TCP.
18 At least it's not a ternary joke. There are 10 types of people, those who understand ternary, those who don't, and those who confuse it with binary.
19 Image from https://en.wikipedia.org/wiki/File:PC_Load_Letter.jpg and in the public domain according to that.

steering wheel. Finally I read the fine manual[20], and figured out that there was a button between the two front seats that had accidentally been pressed. I can't actually remember what "SPORT" means now.

<slide>Tux.[21]
Another example, so, I bought a new laptop[22]. At some point the USB ports wouldn't work. They provided power to stuff, but nothing else. Things plugged in didn't show up in the usual places or logs. There was something wrong deep in the system. A friend said I might have to re-install everything. In the end a simple reboot fixed the problem, it's been working fine since. (I never even ended up working out what the issue was.)

<slide>micrographic scanner
At my work place we have some micrographic scanners. A red light was showing. I followed the usual process, except that at "try" I missed the "is it plugged in?" step.

<slide>back of scanner
A colleague pointed out that one of the, I think three, power cables wasn't plugged in properly. The device was getting enough power to show a red light, but not enough to actually work...

<slide>repeat process
So, that's it. If you follow the process I've outlined, you'll be the star of your work place in no time. Soon you'll discover that the magic was inside of you all along[23].
Can we fix it? Yes we can.[24]

<slide> fin.
Thank you. You can find copies of the slides, the talk, etc. on my website. Address is on the screen. I've been advised to tell you that the talk has footnotes, so if you didn't get all the references, check it out. Questions? Comments?

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20 After having stopped at my destination.
21 Image from https://en.wikipedia.org/wiki/File:Tux.svg which says: "The copyright holder of this file allows anyone to use it for any purpose, provided that the copyright holder is properly attributed. Redistribution, derivative work, commercial use, and all other use is permitted. Attribution: lewing@isc.tamu.edu Larry Ewing and The GIMP". Original version from <https://isc.tamu.edu/~lewing/linux/>, which says "Permission to use and/or modify this image is granted provided you acknowledge me lewing@isc.tamu.edu and The GIMP if someone asks." <http://www.home.unix-ag.org/simon/penguin/> says also: "... the Linux Logo has been vectorized by me (Simon Budig, http://www.home.unix-ag.org/simon/).", which I guess, seeing as I'm using an SVG, means that I'm using a Simon Budig version?
22 I nuked Windows, because who wants that spyware? I'm currently using Ubuntu.
23 Meme. See <https://allthetropes.fandom.com/wiki/It_Was_with_You_All_Along>.
24 Bob the Builder, again

Extras

Memes, jokes, and references that didn't make it into the talk include:

Type Google into Google to get to Google
Red Dwarf related stuff: it's cold outside, there's no kind of atmosphere...
No sonic screwdriver required
Something something dead parrot or some other Monty Python joke.
Did you know: I am a millennial. that is, Gen Y. We get a lot of flack, but I was taught computing. I also didn't fail primary school; I can read and comprehend.

other points

skills for resume
read the road ahead, predict issues, fix them before they get worse.
You aren't an idiot, you don't need to call IT for every small thing.

Additional stuff that didn't make it into the talk:

<slide>non-obvious
Not all problems have a nice, easy fix. Sometimes you have to squint, or realise that your problem or solution is in a different area than you first thought.

<slide>non-sync papercut with sierra
Once our print system was not syncing with our membership system. No obvious solution. We don't have access to the backend to even try anything. A solution though was to use pre-existing cards meant for another purpose. This tided us over until someone who has access could fix the issue.