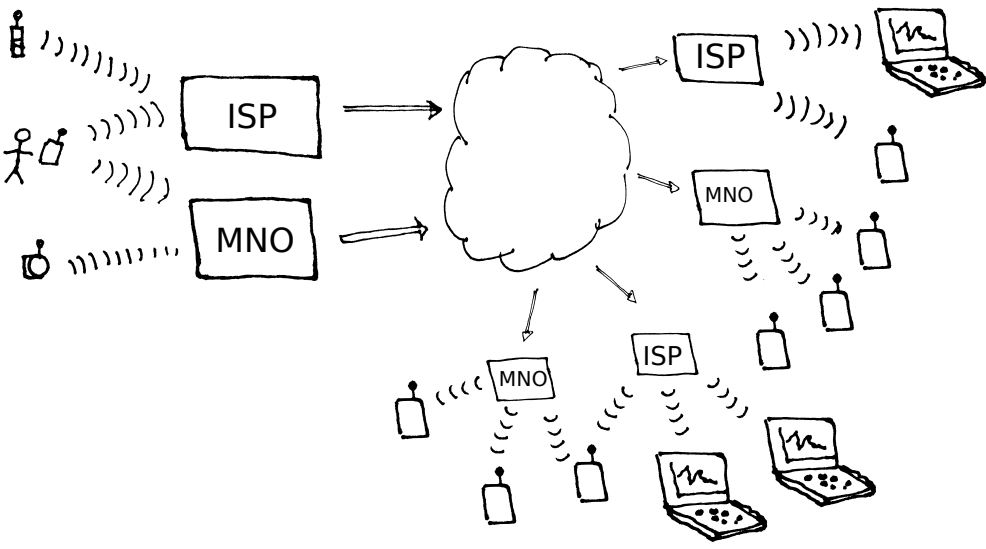


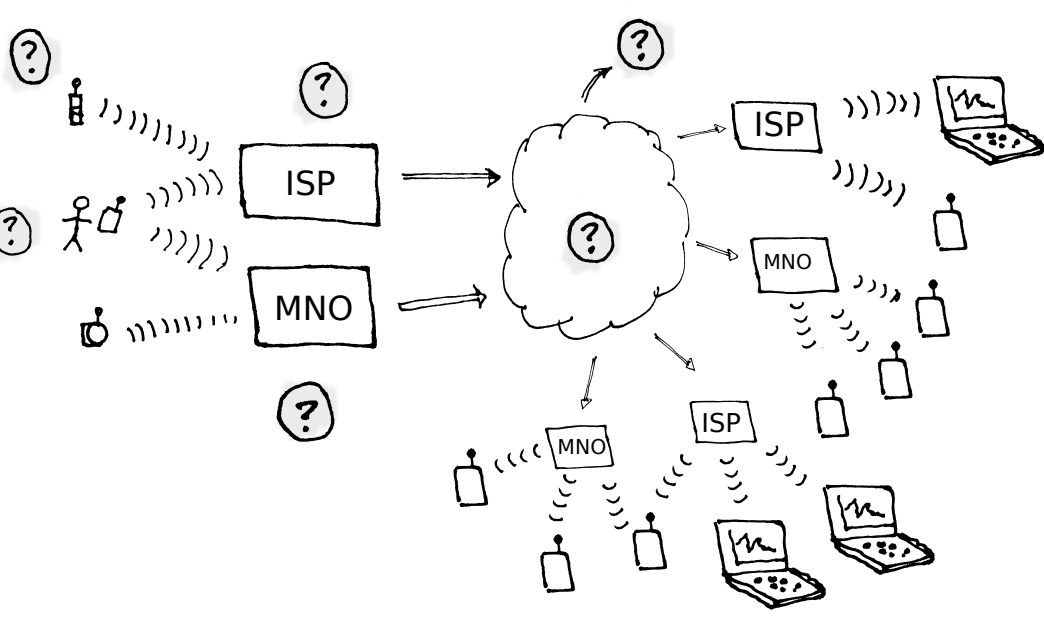
What is  an **Open Pipe Kit** good for?

Well ... everyone is doing **sensor-y things** these days!

And the typical "**internet of things**" approach is something like this:



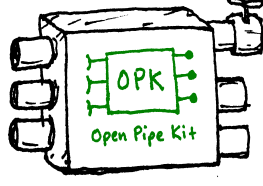
A little confusing and opaque, but seems alright ...
... until you realize that it's got a lot of **'fragile hardware'** and **'possible data leaks'** ...



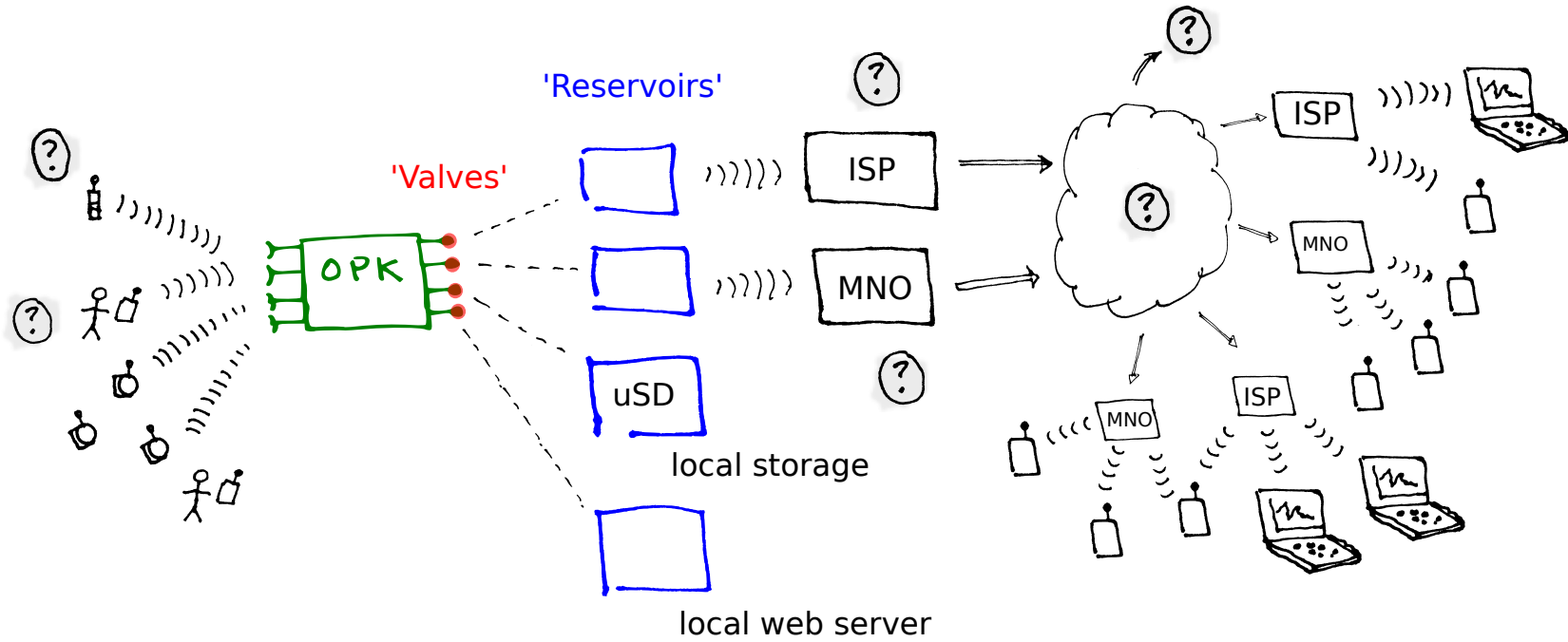
Will the cloud-based service you're using **still exist** in 3 months?
Will they allow you to **migrate** your data? Are they hosting your data **securely**?
Can you easily add **new** sensors to your system?
Can you **customize** and **simplify** the web interface for your particular needs?

More often than not, the answer is **'no'** ...
... or, at best, **'maybe / sort of'** ...

That's why we're working on the Open Pipe Kit!



The OPK system is an open hardware and open software 'layer' between your sensors and the outside world. It uses a 'pipe' and 'reservoir' metaphor in its design, so that it's easier to **understand** and **control** the 'flows' of data in your project.

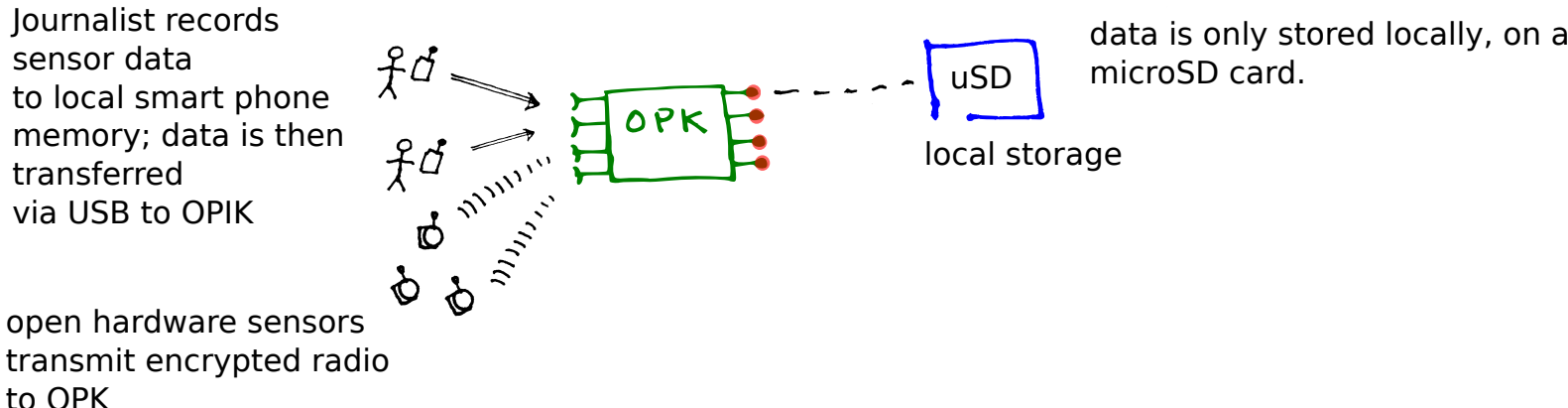


EEK! **Another** layer? Isn't this more confusing?

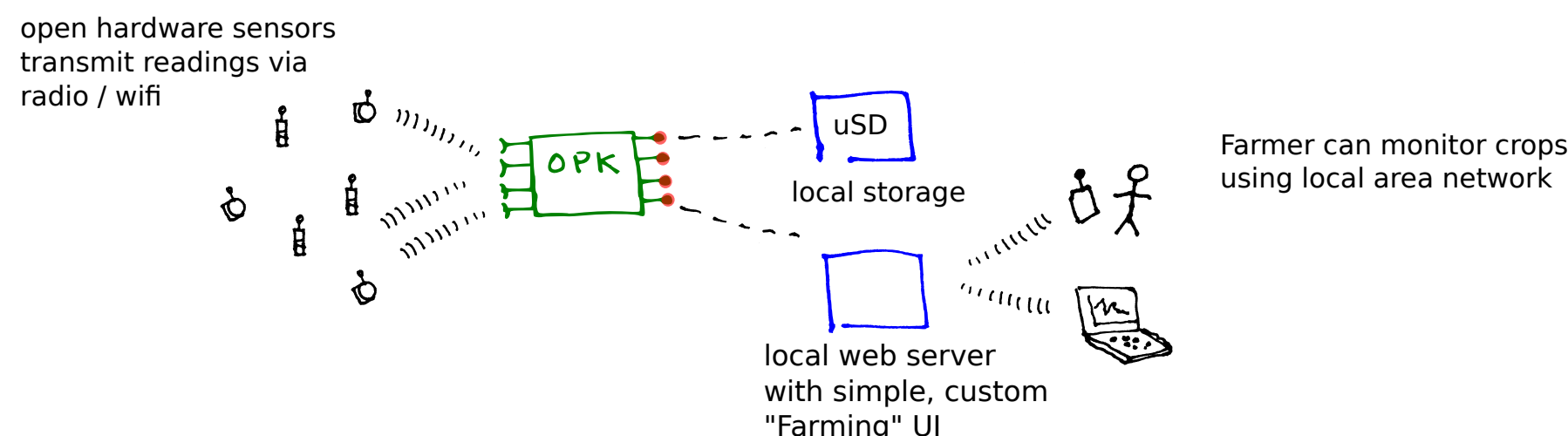
Actually, this OPK layer **simplifies** the system -- now you can know **exactly where your data is going**, where it's being stored -- and you can rely on your **own, custom, simplified system**, tailored to your particular project's needs.

For example ...

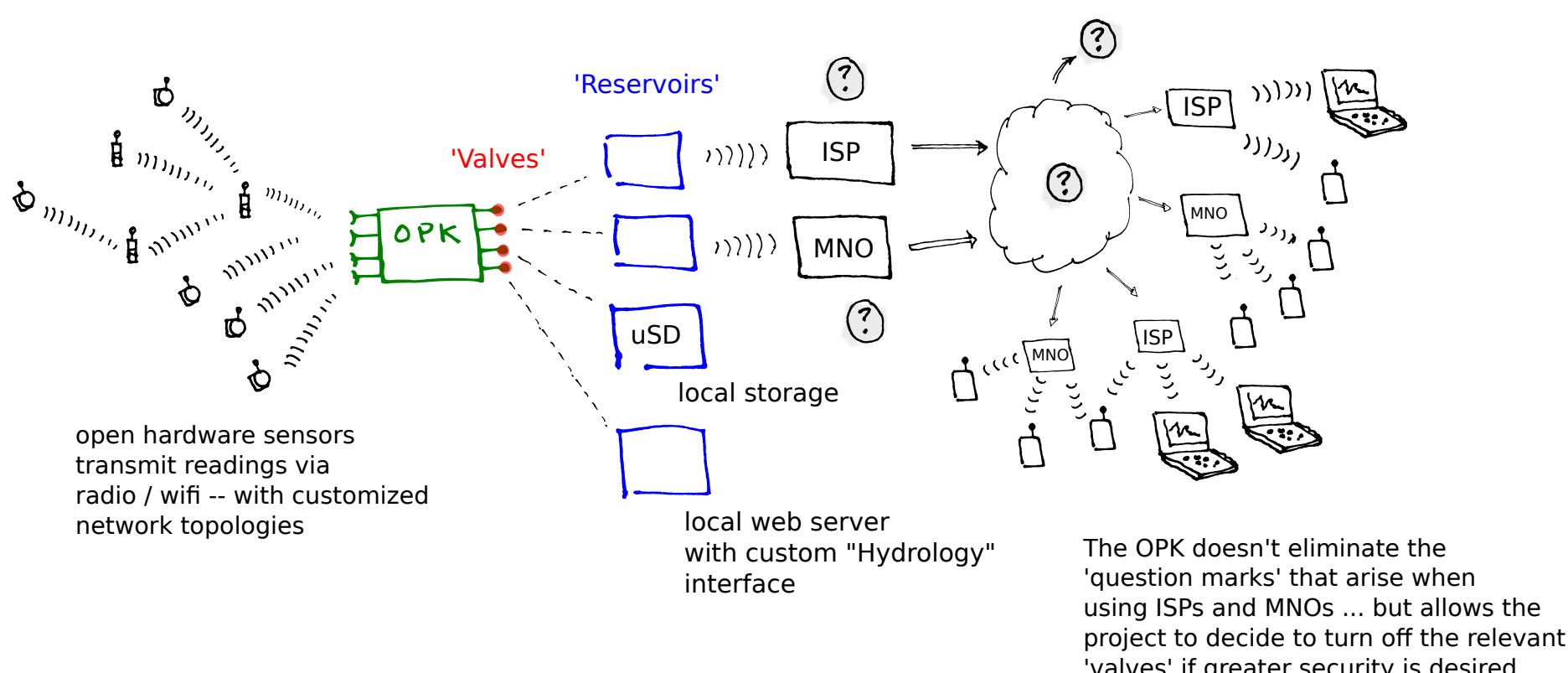
Journalists interested in monitoring local air quality conditions might be worried that their investigation, if discovered, might be shut down. They want to gather sensor data **locally** and **securely**. So, their news organization quickly develops and releases a **custom OPK** that allows them to store their data to **local storage** (an SD card, say), and can then be carried via courier back to the news organization's headquarters:



Farmers interested in soil health and microclimates might be located off-grid -- but still want to be able to record data and display it on a **local web page**, using wifi and smart phones on their farm. (They might also be interested in making sure their data flows **where they want it to**, and nowhere else.)



Environmental researchers and activists might like to monitor many sensors in the field, and might already have particular cloud-based services upon which they rely. Using an OPK allows them to easily **keep a local backup**, and to **switch to alternative cloud-based services** if they want to.



(This above configuration might also work well for **librarians** interested in monitoring the usage of a **tool lending library**.)

Okay ... so, this OPK sounds good ... but **what is it**, exactly? How does this OPK magic work?

Our initial prototype version of the OPK is simply a **\$35 Raspberry Pi linux computer** and an under-\$10 wifi dongle, running the open source 'web stack' and set of 'sensor drivers' that we've been developing.



Our goal for the OPK is to develop a modular open software kit that can run on the most widely-available, least expensive, and best-supported hardware out there. That's why we're starting with the **Raspberry Pi** -- it's the best example of this sort of device right now. But the same OPK approach can be used on other hardware, too -- the Beagle Bone Black, for example. Our hope is that the software we're developing is useful enough to people that they generate their own, custom versions of the OPK on whatever hardware they find most convenient.

Our **initial plan** is to spend the next few months working on a '**minimal**' version of the OPK: a **single USB sensor** (for temperature, or for water depth) recording values locally to the Raspberry Pi uSD card in a database; along with a **custom, simplified user interface** for monitoring these sensor readings via a **local web server**, using an **under-\$10 wifi dongle**.

If you find this OPK project useful, please join in on the fun and help us develop it further! You can find project updates, code, and research notes under '**OPK**' tags in both the **FarmHack.net** and **PublicLab.org** open source communities, online.

Cheers!

The OPK Team