

Speaker Notes – IoT Industry Council

“Approaches to managing IoT connectivity”

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[SLIDE – Connectivity]

- Unfortunately, IoT connectivity has no simple answer
- And that makes it quite a difficult decision - Finding the best way to connect devices at scale.
- Companies often underestimate the complexity of managing device connectivity – and is often left as the very last part of the project.

[SLIDE – Good bad ugly]

- At Flickswitch we have had a pretty unique view into IoT device deployment in Africa for over 10 years – even before the word “IoT” was even used.
- We have seen the good, the bad and the very ugly.
- We have over the years dealt with many IoT deployments, especially in the medium sized IoT sector (<10,000 devices) where a IoT of innovation is taking place.
- I certainly don’t presume to have all the answers, but today I’d like to simply share some of our practical learnings, and hopefully help especially new entrants avoid some big potholes.

[SLIDE: Hardware vs Software]

- As the interest in IoT has grown, we are seeing a lot more players entering this field.
- We find most companies are typically either stronger on the hardware side, or stronger on the software/platform side. (Sometimes strong on no sides – The calls we get still includes “I just ordered 200 IoT devices on Alibaba - please help”).

[SLIDE: Arduino & USB modem]

- Building reliable IoT hardware is bloody hard, but more plug-and-play device options are making some hardware deployments much easier for people without this knowledge.
- And yes, you also get the “let’s strap an Arduino onto a USB modem with duct tape inside an old Smartie box” type IoT deployments. What can possibly go wrong...

[SLIDE: AWS/Azure]

- Similarly, IoT software platforms are becoming more plug-and-play. With your dad’s credit card you can basically point your devices to a cloud platform, collect data and build fancy live dashboards that you can flog to unsuspecting corporate customers. Throw in a few IF-statements and you have AI covered.
- And this is all great for our industry – barriers and cost to entry are far lower than they used to be and are steadily decreasing.
- And the Gartner IoT predictions are getting so big they are starting to make up new numbers. “44 Gabazillions devices by 20-voetsek”
- But building and deploying enterprise grade IoT solutions with a lifespan and proper ROI remains bloody hard.

[SLIDE – Stock Pic]

- By the way, having this stock pick on your website doesn’t mean you are ready to build IoT solutions.

[SLIDE: 2G/3G/4G...]

- Getting back to connectivity... Reliable and cost-effective IoT connectivity remains critical for any project.
- You can have the best hardware with the best platform – but we have seen projects fail because people underestimated the complexity or cost around reliable connectivity.
- Now there are lots of ways to connect IOT devices... Wifi, mobile/GSM, satellite, Sigfox, Lora, NB-IOT and others.
- Each has its place and each has its pro's and cons. Newer connectivity methods - especially on the low-power side – will really make the IOT cake much bigger allowing new use cases to develop.
- Choosing the ideal connectivity method for your project is usually driven from both a technical as well as a commercial (cost) perspective.
- Your ideal technical choice simply may not fit your commercial model.

- At Flickswitch we have had a pretty unique “sideline” view on this over the last 10 years, being network agnostic, industry agnostic and spread over several African countries.

[SLIDE: IoT application]

- In Kenya specifically we have seen how IOT with GSM connectivity can unlock some pretty ingenious business models while in SA power issues and the recent drought has seen IoT take a leading role in using tech to address these complex problems.
- Most of our experience has focused on Mobile GSM device connectivity, although as newer connectivity methods mature these are becoming a part of the picture.
- But for now I will focus on GSM SIM management at scale.

[SLIDE: Cell tower]

- Navigating your options around SIM types is the first decision. Which SIM type is best suited to my project and my business model...?
- Is it Managed Prepaid, Shared APN, Private APN, Roaming SIMs?
- Mobile networks themselves also offer so many different products, often competing with themselves. The advice will often depend on who you speak to in which division.
- There is unfortunately not a single option that is best for every type of device or project.
- Every deployment is different – Project length, budget constraints, scale, flexibility needed, data cost sensitivity, SIM lifecycle, IP & data routing requirements, roaming/no roaming.
- Many of the pro's and con's are also not directly comparable, which means you end up making trade-offs in either cost, technical ability or reliability. Which is ok.

- *Example:* For a POS terminal provider the fact that a SIM can roam on both Vodacom and MTN has more value than a slightly higher data rate.
- *Example:* For an on-board video provider, data costs far outstrips coverage. And for them APN data is simply too expensive.
- *Example:* For someone deploying open Android devices, MDM, data routing a firewalling is more critical. For them a Managed APN might be better.

- So we find in the real world companies typically end up with a mix of different SIM types for different projects. One size simply doesn't fit all.

[SLIDE: Complex Network Diagram]

- We also find that many modern IoT solutions are moving towards simplicity, like being able to use public APN's and not needing fixed IP addresses or server-initiated comms.
- A simpler architecture typically means that you are open to more, and cheaper SIM options.
- Especially when deploying devices into other African countries we find that public APN infrastructure is much more reliable with far fewer points of failure. The chances of your whole SIM base being offline is fairly remote.

- Being able to do OTA device updates and remotely update APN and other settings also gives you more flexibility.
- The advice we often give is KEEP ARCHITECTURE IT AS SIMPLE AS POSSIBLE, so that you have more options with regards to connectivity.
- Data security concerns are also being addressed more on the data encryption level than on the carrier & network level. So there is less need for complicated custom routing and tunnelling.
- If you can do your banking from your phone you can surely send your alarm signals over the same network.

I'd like to talk about some Business Models around connectivity

We have come across 3 main models to incorporate connectivity costs into your product:

[SLIDE: Angry customer]

- 1) **Leave it to your customer.** Managing device connectivity is hard right, we definitely don't want to get involved. We have seen this a lot - especially in consumer IOT. (Remember kids GPS watches?)
 - *Outcome:* 9/10 times it gets done badly by the customer, and then the whole solution falls flat – “This bloody thing doesn't work”.
 - It also leads to major increase in support load - due to bad SIM management.
 - The customer on-boarding experience is also clumsy – customer needs to source own SIMs - not good for pushing sales.
 - B2B side - Corporate IT departments don't always know how to manage IoT SIMs properly.
 - Lots of hidden costs with this model.

[SLIDE: Charge for it - Dollar Sign]

- 2) **Charge for it.** Add it as an additional disclosed cost to your solution (monthly/yearly cost). Sell the dog tracker with 12 months of connectivity included.
 - If you have proper control over your SIM base and can manage your risks properly without signing your life away, you can actually make a small profit on this.
 - Or worst case, if you really don't want to do SIM management, help the customer get the right SIM with easy way to manage them. Ship devices with a SIM installed & instructions or refer to someone who can help them with SIM management.

[SLIDE: It just works – Happy customer - magic]

- 3) **Bundle it.** Making connectivity invisible as part of your overall solution cost. The best example of this is the tracking industry, Amazon Kindle or Olarm.
 - The customer doesn't know how much of your solution cost is connectivity. IT JUST WORKS.
 - This model works great where you have fairly predictable data usage and can manage your risks.
 - Or if not (like CCTV) include an amount of data, and only charge for overs.
 - By “owning” the connectivity, you also have a stickier relationship, as a certain municipality learned the hard way a few years ago.
 - This approach has the best customer experience, but here SIM lifecycle becomes very important – how long does it take a device to go from testing to being sold to being used. You could incur some hidden costs during this time.

[SLIDE – Thank You and e-mail]

- Over the years we have seen the wrong connectivity choices lead to some nasty project disasters. We have seen telco bills larger than the value of the startup that owned them. We have also seen some pretty smooth IoT device deployments.

Good luck with matching up your hardware, connectivity and software! **Questions?**