Growing from the Edges:
A Plan for the Next Billion Seconds

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INTRODUCTION

It's possible some of you haven't worked with a futurist before, so let me demystify what it is that I do.

My job is to advise clients on how they can 'lean into' trends.

It's easier to move forward when you have a good tailwind then when you have to fight a strong headwind.

And it's this that a futurist can help with.

One of my clients over the last handful of years has been the G20.

One part of the G20 - the Global Project for Financial Inclusion - focuses specifically on developing and emerging economies. I've had the opportunity to learn a lot from my work with them.

And that's led me to want to be very bold today.

The challenge I set for myself - and the one I'll set before you - is to grow Papua New Guinea from a country with a per-capita GDP of $2.200 to a country with a per-capita income of greater than $10,000.

From a low income to middle income economy: And do it in thirty years.

Thirty years is an interesting length of time, because it's almost exactly equivalent to a billion seconds.

That's how I like to think of it - because I recently launched a podcast titled The Next Billion Seconds - where I talk to the people inventing the future.

A billion seconds takes us all the way to 2050.

By putting the right processes in motion today, Papua New Guinea can be in an incredible position by 2050.

And you already have a Vision 2050 plan - my recommendations today sit alongside that plan.

I set another challenge for myself - respect the culture of Papua New Guinea - which has the distinction of being one of the least urban nations in the world.

Because I want you to take these recommendations on board - and you can only do that if it's possible to implement these recommendations.

Which means they have to work for you, from where you are now.

So while I may have my eyes on the goal, I've got my feet planted firmly on the ground.

I've spent the last six months doing my research, and compiling these recommendations.

So, without further ado...

PART ONE - THE INFRASTRUCTURE PLAN 2018 - 2022

The first, most important trend you need to understand is this: the smartphone is the most important tool since the invention of the metal axe handle, a few thousand years ago.

A smartphone is a universal tool - and as we get a bit deeper into things you'll get a sense of all of the ways the smartphone will be used by everyone, everywhere.

Current projections tell us that by the end of 2020 - forty eight months from now - roughly eighty percent of all adults on the planet will be using a smartphone.

A technology that was invented only ten years ago soon will be completely pervasive.

Because it's so useful.

And it's so useful because it's general purpose. A smartphone can be used for communication, for commerce, for education, for community, for culture - and the list goes on.

We've only just started to scratch the surface.

So recommendation number one is simple, and straightforward: make the policy and commercial decisions to drive up the rates of smartphone ownership.

As of January nearly 40% of Papua New Guineans owned a mobile.

While I don't precise have statistics, it's likely that a bit more than half of these folks would own a smartphone. So that's a smartphone ownership rate of around maybe 25%.

Set a target, over the next five years, to drive the rate of smartphone ownership from 25% of the adult population to 85%.

Exceed the global average.

At the same time - and this is the other half of that recommendation - build out the mobile infrastructure so that the entire nation has mobile coverage - and mobile broadband capacity.

That's a significant investment in telecoms, an investment that provides a utility services with fairly predictable revenues.

How will that investment be paid for?

The usual way is by charging high tariff fees for the use of that infrastructure.

High tariffs will discourage users - exactly the opposite of the behavior we want to see Papua New Guineans lean into.

So the telcos need to find another way to recoup their investments - one that doesn't rely primarily on charging a lot for minutes and data.

So here's my third recommendation: allow the telcos to go into banking.

Mobile money is already offered in Papua New Guinea - and it can be a powerful accelerant to the economy.

Mobile money brings the unbanked into the banking system, and provides an pervasive payments platform for both individuals and businesses.

It also creates an audit trail - which is great for the tax collector.

When mobile money gets introduced to a country, there's often a bit of a scuffle, as the banking regulators and telco regulators figure out who gets the benefits - and the blame.

I suggest the best way to solve this is put the two together. Let the telcos go into banking - and let the banks compete by going into telecoms.

In practice this means there'll be some interesting acquisitions - Digicel would likely either buy or merge with a bank.

The outcome will be some of the most interesting businesses in the world, that understand both banking and communications.

Businesses that will be able to provide cheap and safe banking for everyone in Papua New Guinea, on cheap and reliable mobile networks.

The profits made in finance will both amplify the reach of the banking system - and defray the costs for the telco infrastructure needed to earn those profits.

So these are the three core infrastructure elements Papua New Guinea will need over the next five years:

- A high rate of smartphone ownership
- Low tariffs on voice & data
- A combined banking and telco industry service offering

Now why are people going to want these mobiles? For more than banking, obviously.

And this comes back to a smartphone as a universal tool.

It's going to start very simply - increasing human capacity.

We want every child in PNG to have access - via their parent - to a smartphone.

Why? Because Wikipedia.

Wikipedia already exists in English, 'Simple English', and Tok Pisin.

Ah, but here's another challenge. While there are over five million articles in the English language edition of Wikipedia, there's not even quite 1,500 articles in the Tok Pisin version.

I know Jimmy Wales, the bloke who started Wikipedia, and he says that to get a new language version of Wikipedia going, it takes five dedicated individuals.

Mostly they spend their time translating articles from one language into their language.

It takes time. It's hard work. But it works.

So that's the next challenge - can you find a way to sponsor a team of folks to get the Tok Pisin version of Wikipedia going strong?

I mention this because - one other recommendation - you're going to have the telcos offer Wikipedia to mobile users free of charge - just Facebook and Twitter are.

Because it's the best learning tool we've yet created. It's not perfect. But it's better than anything else we've got - and it's created by all of us.

And making it freely available creates the opportunity for more people to use it.

They'll learn more, and they'll add their own entries - in English or German or Tok Pisin.

You'll have the best of all worlds - where Papua New Guineans create their own version of Wikipedia, driven by their own needs and interests.

(I can imagine the sections on rugby league will be very detailed.)

That's a learning tool for kids and adults.

And that's the point.

A smartphone is a tool for communication.

It's a tool for commerce.

But above and beyond everything else, it's a tool for sharing.

For sharing what we know.

For sharing what we need.

For sharing what we have to offer.

And - best of all - all of this works both in the city and in highlands. The signal will reach everyone everywhere, and where the signal reaches, smartphones, sharing, knowledge and commerce will follow.

All of this will happen by itself - slowly.

But this is the way the wind is blowing, so if you lean into it - by prioritising the infrastructure that supports sharing, and placing value on the kinds of sharing that improve the capacities and resilience of the nation, you can create a cycle of positive reinforcement that gets people and businesses doing the right thing because it does right by them.

Which is why you talk to a futurist.

Now getting all of this done will take some time. People move quickly, businesses gradually, and governments glacially.

But the government can frame a vision for where they want the nation to be in the early 2020s. Businesses will respond to that, and plan for that world. People will step up to take their part in building that future.

In the background, the government will do the slow, hard, detailed work of marrying the financial system to the telcos in a way that doesn't cause either of them to become wildly unstable.

The Bank of Papua New Guinea will have a lot of advice to offer on how to make this all work in a way that brings people into a mobile banking system in a way that is sustainable and profitable.

They'll tell you to move slowly, gradually - but deliberately.

That's good advice - but start on it today.

Because the people aren't going to stop moving. They're already moving. And you're going to need to keep pace with them, so that - in five years time - you're ready for them, and able to meet their needs.

PART TWO: THE DIGITAL ECONOMY 2023 - 2032

The further we lean into the future, the more interesting it gets.

Mobile money has been available in Papua New Guinea for a few years.

It's a low-cost, low-impact means to bring people into the money economy and banking system.

But it's only the beginning of where we're going.

At around the same time the smartphone launched, another technology - this time, straight out of banking - came onto the scene.

Distributed ledgers, or blockchains or cryptocurrencies - whatever word you want to use for them - provide all of the advantages of physical banknotes - and many more besides.

It turns money into something that is fully digital - and secure. No worries about counterfeiting or cooked books. Plus it provides a complete audit trail of all transactions.

You may have heard of Bitcoin - that's the most well-known example of this sort of currency.

But Bitcoin is a bit of an exception, because it's not connected to any central bank. It floats free from any regulation - which makes it a bit of a problem for bankers.

But bankers do like the idea of truly digital money - so they've had a go.

For the last several years many central banks - including some very close to Papua New Guinea - have been developing their own digital currencies.

Earlier this year Singapore announced it was working on a project to connect all of the world's central banks using digital ledgers.

That's a great step forward for central banks - making their operations faster and more efficient.

But that's only the beginning.

The Singaporeans are also looking at creating a 'digital Singapore Dollar' using distributed ledgers. That's dollars, issued by the Monetary Authority of Singapore, in digital form.

That money will only ever exist in digital form.

Why do this?

Again, it goes back to the birth of these digital currencies - they popped up at the same time as the smartphone.

Smartphones provide incredible capacity. But the one thing they don't do well - anywhere - is financial transactions.

We have lots of bolt-ons where people tie their credit cards to their smartphones. But that solution is clunky and only makes sense where there is pervasive usage of credit cards.

Which is not PNG.

If we want to make smartphones instruments of commerce - so people can trade with one another, wherever they are - we have to create a form of money that works well with smartphones.

Digital money.

Digital money and smartphones go together like bread and butter.

Each needs the other.

So while mobile money is a great place to start, it's not the end.

So over this next decade, I recommend PNG move toward a fully digital money economy.

The technology is neither expensive nor difficult to use - and will be that much easier in five years time.

And with smartphone ownership rates reaching eighty or eighty-five percent by 2022, there will be a broad base of Papua New Guineans ready to use digital money.

Digital money doesn't just give every individual access to the banking system - it means that every individual becomes a bank.

Now I don't mean that in the formal sense of everyone doing fractional reserve lending or trade finance.

But I do mean it in the sense that every individual working with digital money has the same capacity to manage money as any bank. They can hold digital money as securely as any bank.

When that happens, individuals and businesses will be free to trade as never before. There will be no question about access to the banking system. It will all be about access to capital.

And capital will be available everywhere - because the banking system will be everywhere.

The other side of this technology of distributed ledgers is proof of ownership.

This is already proving to be vital in other parts of the world where land title has never been well documented. It creates an unbreakable chain of custody for title.

That will be enormously valuable in Papua New Guinea.

But, again, that's just the beginning.

Because all trade goods - whether agricultural or mineral or industrial - can also be tracked and traded via distributed ledgers.

Farmers are already using these technologies to help them manage and maximise the value of their crops.

So it's not just the banking system that ends up going digital. It's the entire market.

And this is the part that is vitally important. Because right now it's hard and slow and expensive to form markets - everywhere, not just in Papua New Guinea.

But with distributed ledgers it's simple and fast and cheap.

So when people want to trade goods and services, there will be a mechanism in place that will make it easy to do so.

It facilitates a transition to a money-economy-plus - where there is both an economy of digital money and a trade economy that looks something like a barter economy, but is so connected to the digital money economy through exchanges that it is fully and correctly monetised.

It all sounds very complex, but for most people everywhere it will be no more complicated than a smartphone app.

So the second recommendation for this decade is that Papua New Guinea create the space and conditions for local talent to focus on app development that will facilitate the management of digital currencies and a digital trade economy.

You already have Kumul Gamechangers, a program geared at encouraging tech and app entrepreneurs - lean into that program, listen closely the needs of the people and businesses of Papua New Guinea, and let them get creative.

What will they create?

Some of it will look like the banking apps we have today. Some of it looks a bit more like Australia's Gumtree or China's Alibaba or America's eBay. And other parts look like the sorts of commodities exchanges you'd see in Chicago. Different apps for different needs.

But if you make it easy for people to trade - because of digital money and digital markets - people will trade.

They will enjoy the benefits of a very advanced money economy wherever they are in Papua New Guinea, because all of these advantages will be delivered via that universal tool - the smartphone - which works well wherever they are, because of the infrastructure investments made in the first five years.

The third recommendation is that Papua New Guinea make the necessary investments in educating its people on how to make best use of these new tools.

Start with mobile money, commerce, then digital money and trade, then step by step, in conjunction with the release of apps designed to be both easy-to-use and powerful, guide them into a market economy that is both very powerful and entirely decentralised.

It needs to be pointed out - because some are likely worrying - digital money and digital trade does not pose a threat to the banks.

Most traders will be using apps that are tied into the banks, and will likely keep their digital money in a bank when they're not using it for working capital.

Digital currency amplifies the reach of banks, just as it amplifies the capacities of individuals.

Though it does mean the banks will need to run to keep up.

Now again, this is a huge change - moving from a physical money economy where banking is rare and difficult and expensive to a digital money economy where banking is ubiquitous and cheap and easy - and a transition into it will take some time.

That's why this second part of the strategy takes a whole decade. At the beginning, with the infrastructure in place, the first digital money services can be tested and rolled out.

There will be time to learn from people what works and what doesn't. There will be time to evolve digital money services so they closely match the needs of the people using those services. There will be time to learn how to do it right.

For example, when the first mobile money system - M-PESA - launched in Kenya back in 2007, they had no idea it would mushroom into such a huge economic amplifier.

The governor of the Central Bank of Kenya told me that if they had known, they never would have approved it.

But it went out there, and as people used it, they realised they needed more than peer-to-peer banking. They needed merchant services.

Startups provided those merchant services, and realised they now had audit trails from Kenya's small businesses - so they built analytics tools to help those businesses.

And from those analytics, they were able to qualify those businesses for lines of credit at a fraction of what it cost a Kenyan bank.

So mobile money connected SMEs to the banking system - efficiently.

That wasn't the intention of mobile money, but, because Kenyans learned and took advantage of what they'd learned, they've made the most of their opportunities - and have one of the fastest growing economies in the world.

Papua New Guinea will present the same sorts of opportunities as it transitions into a digital economy.

Look at how people trade - how you can help them trade? What sorts of tools do they need to extend their reach? How can you bring people into a trading economy that's fully digital?

One more thing, before we finish up with this decade and move on into the last half billion seconds...

Logistics. How do you move trade goods from one place to another in a country that will remain largely rural, with difficult terrain.

The answer to that is obvious: drones.

During the decade of 2023-2032, high capacity autonomous drones - capable of carrying several hundred kilograms - will become familiar, and, if not exactly cheap, affordable.

As these drones are fully autonomous - they fly themselves - and electric, they're inexpensive to operate.

With the deployment of these autonomous cargo drones, the marginal cost of moving goods across Papua New Guinea will drop to a fraction of its current cost - opening up even more opportunities for trade.

So my final recommendation for this decade is that Papua New Guinea invest in the necessary infrastructure and air traffic control systems to enable the widespread deployment of cargo drones across the entire country.

PART THREE: INTELLIGENCE 2033 - 2048

Before we really get stuck into that last half billion seconds, I want to circle back briefly to the why of the drones, because it's the same why as everything else here.

An autonomous drone is a smartphone with propellers. All of the smarts needed to keep a drone correctly balanced in flight, and to have it fly autonomously, are available in the smartphones of 2017.

So we don't need to imagine any huge leap in technology to get autonomous drones flying freight all over Papua New Guinea.

All we need are some interesting drone designs - which I'm already seeing in one of my other roles, as a mentor at the University of Sydney's INCUBATE program.

One of the startups in this current intake is designing a drone that will carry 150 kilos of payload. Give him another couple of years and it will be ready for market.

And if he's doing it, hundreds of others are - particularly in China. Expect a wave of cheap freight drones out of China - because we're already well on the way there.

Through another connection at the University of Sydney, I met Dr. Salah Sukkarieh, who runs the Australian Centre for Field Robotics. He's got a startling vision for what's possible in farming robotics.

You see, a farming robot - which sounds very expensive and complex - is really anything but.

It's a set of two wheels with a small but powerful computer controlling their operation, and using a camera to examine the crops for pests and disease - then advise the farmer on how to use the smallest amount of inputs of fertiliser and pesticides most effectively.

Now all of that kit sounds expensive. But the farming robots they're now field testing at the Centre use a smartphone as the brains.

We're coming back to the smartphone again and again. As I stated at the beginning, the smartphone is a general purpose tool. It's useful for many things.

Some of those things involve money and commerce. Some of them - like drones - involve logistics. Some of them - like this farming robot - involve agriculture.

And because the smartphone is connected to the mobile broadband networks infrastructure deployed in the first five years of this plan, these farm robots are well connected.

They scan the crops, and whatever they see that they don't understand they share with the broader community of farming robots. In this way, all of the farmers - and farming robots - are learning from one another.

All of this is fed into an app that observes what the farmers do, learns from this, and then makes recommendations to those farmers when they encounter an unfamiliar situation.

The farming robot is more than just a dumb tool. It is connected and intelligent. And it brings that intelligence to every farmer.

It's a robot that makes the farmers smarter farmers - and more productive ones.

And because this farm robot is built from off-the-shelf parts - including a smartphone - it's not expensive. The Centre for Field Robotics is working to get the cost below $2000.

That sounds like a lot before you reckon a single robot would likely be shared across an entire village of farmers - all of whom earn enough extra, because of the productivity increase they gain from the robot - that it quickly pays for itself.

The smartphone is going to transform agriculture over the next billion seconds. Even where there's no farming robot, farmers will use the smartphone camera to scan their crops, looking for problems, grading their produce, and putting it up for sale even before harvest.

But in that last half billion seconds, the smartphone becomes something else.

It becomes a channel to real intelligence.

We hear a lot about artificial intelligence these days, and about how the robots are going to throw us all out of work.

But it's not going to work that way. Not at all. And certainly not in Papua New Guinea.

What artificial intelligence does is make us better at what we do.

A nurse, working the Highlands, has access to world-class medical resources, available through her smartphone.

She's got a smartphone powered blood testing kit - I've already seen this in production - helping her.

She's bringing high-quality medical care everywhere she goes, because she's connected.

The same is true for teachers, who no longer work alone, but work with the Tok Pisin Wikipedia and all of the other resources created by educators everywhere in the world.

All of these resources are fantastic - and many exist today - but it's the way that we're using them that will change.

We will all be learning, all the time - no matter where we are, no matter what we do.

That learning is going to come to us through our smartphones. Unlike today, it's not going to be about us going out and finding things. Instead, things will come to us.

Why? Because our smartphones will be getting smarter too.

Our smartphones are with us all the time, they watch what we do, they see what we're interested in, they know what we need to know.

They'll be learning from that. Our smartphones will become artificial intelligences in their own right, and as they learn they'll be able to help us more and more to be better at whatever we're trying to do.

So everyone with a smartphone - and by the end of the next billion seconds that's going to be nearly every person in Papua New Guinea - will be working in partnership with a device that's working as hard as it can to make them better, more capable, more resilient -- and smarter.

A farmer is a better farmer. A nurse is a better healer. A teacher is a better educator. A student is a better student.

That's going to happen everywhere, not just in Papua New Guinea.

The middle of the 21st century is going to be dominated by rising intelligence, just as the beginning has been dominated by rising automation.

That intelligence is the final ingredient that lifts Papua New Guinea into a new kind of economy. Decentralised and rural - but very connected and very smart.

The technology has never allowed that.

For the last five thousand years, we've always had to be urban to be materially successful.

Papua New Guinea is hitting its stride at just the moment when that's no longer true.

When the technologies of connectivity make it possible to be smart in place.

To be connected in place. To be commercial and trading in place.

And it's *that* which you need to lean into.

My final recommendation - for the last half billion seconds - is that you do everything to amplify your natural position as one of the most rural nations on Earth.

That has always been an obstacle. But now it's an opportunity.

To make things work well in Papua New Guinea, they *have* to be decentralised. They have to work across the villages and communities spread across the whole length of the country.

That's the promise of what we can do now - but Papua New Guinea is where those technologies must live up to those promises.

That makes it the ideal place to develop the cornerstone technologies of the 21st century, a century that will be both more urban and more rural than ever before.

As the advantages of the city over the bush disappear, people will move freely between them. Right now that migration has all been one way.

But because of what will develop in Papua New Guinea over the next billion seconds, the city and the bush will find a new accommodation - and define a new kind of culture.

That's why I'm so excited for your future. Because Papua New Guinea is that future, and the choices you make today will help determine how much that future looks to you - and how much that future owes to you.