TRANSCRIPT OF PROCEEDINGS

PRODUCTIVITY COMMISSION

PUBLIC HEARINGS

5-YEAR PRODUCTIVITY REVIEW

MONDAY, 8 NOVEMBER 2022

PRODUCTIVITY COMMISSION, L8, 2MQ, 697 COLLINS STREET, MELBOURNE

BEFORE:

COMMISSIONER ALEX ROBSON

COMMISSIONER LISA GROPP

COMMISSIONER MICHAEL BRENNAN

PARTICIPANTS

COMMISSIONER ROBSON: Good morning, everyone. Welcome to the public hearings following the release of our interim reports for the Productivity Commission's five-yearly inquiry into Australia's productivity performance and productivity-improving reforms. My name's Alex Robson, I'm the deputy chair of the Commission and I'm one of the commissioners on this inquiry. My fellow commissioners are Lisa Gropp, who's here with me today, and chair Michael Brenna. Before we begin, I'd just like to remind people of the Productivity Commission's mission, which is to provide independent research and advice to the Australian government on economic, social, and environmental issues affecting the welfare of Australians.

And I'd also like to acknowledge the traditional custodians of the land on which we meet today, the Wurundjeri people of the Kulin Nation. I'd also to pay my respects to elders, past and present. The purpose of this public hearing is to facilitate public scrutiny of the commission's work, and to receive comments and feedback on the interim reports. We're grateful to all the organisations and individuals that have taken the time to prepare submissions and to appear at these hearings. This is the second and final public hearing for this inquiry. We will then be working towards completing a final report, having considered all of the evidence presented at the hearings and in submissions, as well as other form of informal discussions. The final report will be submitted to the Australian government in February 2023. Participants and those who have registered their interest in the inquiry will be advised of the final report's release by government, which may be up to 25 parliamentary sitting days after completion.

Now, we like to conduct all hearings in a reasonably informal manner, but I'd like to remind participants that there are clear structures in our legislation for how these hearings are legally backed, and a full transcript is being taken. For this reason, comments from the floor cannot be taken, but at the end of today's proceedings I'll provide an opportunity for anyone who wishes to do so, to make a brief presentation. The transcript taken today will be made available to participants, and will be available from the Commission's website, following the hearings. Submissions are also available on the website. Participants are not required to take an oath, but are required under the Productivity Commission Act to be truthful in their remarks. Participants are welcome to comment on the issues raised in other submissions. I also ask participants to ensure their remarks are not defamatory of other parties.

All participants who have registered to be here at this hearing have confirmed their understanding that they may be visible or audible online. If anyone here has queries about this or does not wish to be visible or audible online, please approach one of our inquiry team members here today, or feel free to leave the hearing now. For any media representatives attending today, some general rules apply. Please see one of our staff for a handout which explains the rules. Participants should be aware that any media representatives present may be using Twitter and other internet mechanisms to convey information online in real time, including participants' remarks.

This public hearing is being conducted in person and via teleconference. For those in the Melbourne office, in the unlikely event of an emergency requiring the evacuation of this building, the evacuation tone, "whoop, whoop, whoop" will sound. Please follow warden instructions to exit the building via the fire stairs and make your way to the assembly point located at the grass parallel to the tram line at Wurundjeri Way. Participants are invited to make some opening remarks of no more than five or 10 minutes. Keeping the opening remarks brief will allow us the opportunity to discuss matter sin participant submissions in greater detail. I'd now like to welcome Jon Davies. Jon, welcome here today, and if you could please state your name and organisation for the record before you begin, and then we'll hear from you an opening presentation. Thank you, Jon.

MR DAVIES: Yes, thanks, Alex. Jon Davies, CEO, Australian Constructors Association. This is the association that represents the major contractors operating in Australia, across all three key, main sectors, horizontal, vertical, construction services. We are 100 per cent advocacy focused, we're not like some other industry associations that sort of do a lot of member services; we're just purely focused on creating a more sustainable construction industry, and construction, unfortunately, is Australia's productivity laggard.

In a wide field of poor performers, construction stands head-and-shoulders above all else. Construction is the only industry where productivity is now worse than it was 30 years ago. Why is this important? Construction is the nation's fourth-largest industry in terms of employment, and contributes between seven and eight per cent of GDP. It's also the industry that governments are relying on to lead the nation's economic recovery, with the federal government alone spending $61 billion over the next four years on infrastructure. If construction could just close the gap in productivity growth with other major industries, it would result in an annual saving to the economy of $47 billion every single year, and this at a time when the government is figuring out how to pay for worthy initiatives such as the NDIS.

Importantly, productivity improvements are the only real solution also to addressing the capability and capacity constraints that exists within our industry. Just last year, Infrastructure Australia identified a 105,000 shortfall right here, right now; I understand the update to that report is due very soon and will indicate a doubling of that number. And I was fortunate enough to present at the Jobs and Skills Summit, which was focused on immigration and training, amongst other things, but these will not solve the problem that the industry faces. Every other major jurisdiction around the world is doing exactly the same thing we are doing: they're spending big on infrastructure, and so there's huge international competition for resources. And unfortunately, the attraction of Australia as a destination for the skilled migrants has come off. We've had floods, we've had bushfires, we've got a high cost of living, and just to cap it all off, we locked everyone up during covid.

Training as well, as much as that is a worthy thing to do, we're technically at full employment; who is it we're going to be training? We're going to be upskilling people from one industry to another, again, very worthy, but it's not going to generate the volume of people that we need. The only solution to this problem is to get more efficient with the resources that we already have, and to be honest, a large part of this lies in the white-collar space. For sure, we can get more productive at how we pour concrete, for example, but the real opportunity lies in how we procure, deliver, and govern projects. So, the white-collar space. We spend huge amounts of money on procurement processes that tie up hundreds of people, preparing documents that many people won't read, and just to give the illusion - we would contend, to give the illusion of value for money.

But value for money is more than just lowest price at the tender box. It is about improving innovation, digital adoption, sovereign capability, diversity and inclusion, and environmental sustainability. But these things are rarely assessed at tender stage, and if they are, they're never valued. We also have an issue where we prescribe, to the last nut and bolt, how things are to be delivered rather than, sort of, saying, well, this is the solution that we're looking for; this is the outcome that we're looking for, and allowing the market to come up with the best solution. We also have a situation where clients prepare tenders - information for tenders, so at an early stage in a project they'll go out and maybe get some geotechnical work done, and then they pass that information out at tender stage, but importantly, they say to all of the contractors bidding, "You're not allowed to rely on that information."

So, what happens: all of those contractors have to engage a whole bunch of geotechnical consultants themselves, three, four different contractors, just to do the same thing over again. Contracts encourage withholding of information rather than the open and transparent sharing of information that is required for a greater adoption of digital technologies. Project specialists are required to be on projects from the beginning all the way through to the end, even though they may only be required for a couple of months in between. Roles are duplicated by clients and contractors just so they can keep an eye on each other in this adversarial environment.

We have situations where it is stipulated what the project team - what experience the project team should have, even though the contract has a great big stick that if the contractor doesn't perform, you know, there's an opportunity to seek redress. So, we'll have a situation, say, for example, with a $100 million project in Western Sydney, road project, where it will say that the project manager has got to be an engineer; he's got to have 20 years' experience, 10 years of which has got to be working in Bankstown, five years of which has got to be on a particular type of bridge bearing, while in the current market the biggest problem is that person is a unicorn, but even if you could find them, what does a project manager do? A project manager manages people.

And unfortunately for those of - engineers in my industry, quite a lot of the time engineers are probably some of the worst people when it comes to managing people. Very good at technical solutions, but not necessarily best at managing people. So why do we keep stipulating this? Designs are reviewed multiple times by different reviewers who feel compelled to comment in order to justify their engagement. In fact, it's a great definition. I think the definition of all care and no responsibility is some of these design reviews that we have. And it also stifles innovation because there's nothing compelling those reviewers.

In fact, quite a bit it compels them not to approve things that are innovative, things that are different. So, how do we address this issue? As the bankroller of much infrastructure, the federal government has an important role to play in coordinating and incentivising reform. ACA proposed one way to do this was through the creation of a rating tool, the future Australian infrastructure rating, where all federal government projects will be rated against a number of key reform areas, and that score made publicly available.

No need to put a whole bunch of money on the line here; this can work within existing governance, the existing governance framework, but by publishing those scores, that would drive improved outcomes because imagine a situation whereby a metro project in Sydney gets a 5 out of 10 score, and a metro project in Melbourne gets an 8 out of 10 score. You can just imagine the focus that would then be directed at the delivery agencies in Sydney as to why they weren't delivering the same sort of value for money. But, you know, equally, this scheme could form part of the updated national partnership agreement.

That national partnership agreement is due for renewal and needs to be in place for 1 July 2024. But, you know, ultimately productivity will not improve until we move from the view that value is lowest possible price at the tender box, and incentivise real value for the Australian taxpayer. This is not just an economic problem; as I said before, it's a people problem. And we've just published since our last submission - and we'll leave a copy for you - a new report called Disrupt or Die which talks to the productivity problem, but equally and probably more importantly talks to the people problem.

Gen Z, Gen Y don't want to come to work in an adversarial industry with long inflexible hours, where Excel spreadsheets are still considered to be the height of technology, and no consideration is given to environmental improvement. So if we don't change, we will simply run out of workers. That's the reason for the title Disrupt or Die. So, we really need to change, and

it's not incremental change we're calling for; it's significant disruption in how the industry operates. And it was good to see some commentary around the construction industry in the draft reports, the interim reports, but to be quite frank, we don't think that there's enough focus on the construction industry given the size of the opportunity and the problems that exist. Thank you.

COMMISSIONER ROBSON: Okay. Thanks, Jon. I have a couple of questions and then Lisa, if you have any. You mentioned that the productivity slowed down in the construction industry in Australia. Is that similar in other parts of the world or is it just an Australian phenomenon? What's going on particularly in the advanced economies?

MR DAVIES: Look, we're not alone, for sure, in this. There is quite a famous McKinsey report from five/six years ago that identified this as a global phenomena and, sort of, identified, you know, savings in the trillions of dollars worldwide if we can address this problem. I think Australia has got some unique issues in terms of some of the governance structure, especially around the federated nature of the country and how money is granted to the states, and the states have then responsibility for delivering that infrastructure, and so therefore the federal government has historically, sort of, hidden behind that and said, 'Well, you know, it's not our responsibility; all we do is we hand the money to the states.'

But I think that is shirking that responsibility. I think there are things that could be done and should be done in that space, and we can certainly look at - one of the things that happened in the UK - they came out a couple of years ago with a construction playbook which identified best and documented best practice in terms of procuring, delivering government projects. And they said to all the delivery agencies, 'You've got to, you know, use this or give us a good explanation why you're not doing that.' And when we sort of talk to the federal government here about a similar concept, they say, 'Oh, yes, well, they - you know, it's the UK. They do things - it's a different system of governance', but, you know, it wouldn't take too much to look at those state governments as essentially delivery agencies, and so I think that we've - we haven't been focused enough on this. We've been making excuses around this. But - sorry - to come back to your original question, this is a problem worldwide.

COMMISSIONER ROBSON: And, you know, you talked about the white collar, you know, opportunities for productivity gains there. What's your sense of the size of that opportunity? And I think you mentioned, you know, if construction had improved productivity by X, there would be some sort of dollar gain, but just that white collar component. What's your sense of the size of the gains that are possible?

MR DAVIES: Look, it's probably difficult to say because we're comparing multi-factor productivity rates there - - -

COMMISSIONER ROBSON: Yes.

MR DAVIES: - - - to come up with that $47 billion opportunity. So there's a lot of different components to that. But we certainly believe - there's two sort of important parts about the white collar bit. I think that there is a significant opportunity there, but probably the biggest consideration is that that is where the easiest gains lie. You know, we - it wouldn't take much to change procurement processes and to - you know, for example, New South Wales now - transport for New South Wales is allowing contractors to rely on information that they provide as part of tenders. And that's just at a - you know, a stroke of a pen decision that can lead to very substantial improvements. And that's what we believe. Blue collar - there is an opportunity in the blue collar space, but that sort of stuff takes a lot longer to achieve. The real here and now gains are that white collar space.

COMMISSIONER ROBSON: And, you know, there is this - in infrastructure projects at least in Australia and around the world there's systematic underestimation of costs. What's your sense of that and, you know, have you got any solutions to address that issue?

MR DAVIES: Yes, sure. You're right. That is a huge problem because what happens is that we - politicians come to market or go to the public and say, 'Right. We're going to build this road from A to B. It's going to be delivered by next Christmas and it's going to cost $200 million.' And that announcement is made on a P50 estimate at best. And then what happens is things come to pass and estimates are developed further, and there's an "Oh shit" moment where they go, well actually no, we can't do that anymore. But because of the political issue of backtracking on that, then that is the start of a downward spiral where pressure gets put onto contractors to push the price further and further down. And as an industry we have been too guilty in the past of playing that game and accepting that. Saying yes, we can price that risk even though we can't really quantify it. And then we all know the outcome of that. We see it play out on a daily basis where projects are in the news, cost blowouts, big claims being put in. Snowy Hydro's probably the latest example of that.

The solution to this is to take more time at the tender stage to work through, develop the design and to look at what the risks are and try to mitigate some of those risks. So, for example, common risk will be utility risk. There are things that can be done in terms of advanced works to relocate you to the teams that can help in that space. But one thing I'd certainly recommend the commission look at and consider is a concept – a growing concept called Should Cost models. Now Should Cost models aim to provide an earlier and better indication of project cost before the design is developed such that designers can actually be held accountable to a budget rather than the other way around as happens at the minute.

A project is designed, the cost is what the cost is and then that goes to market. But Should Cost modelling is a way to improve that. We just provided an opportunity to a consultancy firm that specialises in this out of the UK to do a full leadership piece on that for us. And it's certainly something that's getting traction in the UK as being a solution to this problem.

COMMISSIONER ROBSON: And have you done any work or had thoughts on this issue of, you know, new projects versus maintenance of existing infrastructure and the extent to which, you know, that decision is being distorted at the, sort of, governance level?

MR DAVIES: Look, I think my members would not take too kindly to me suggesting that we should be doing more maintenance and building less projects, but for sure there is something to be said for getting more benefit out of existing assets and sweating those assets for longer. I don't think enough work has been done on that issue, but you will always have the problem there with the politics. It's not sexy coming out and announcing a new maintenance upgrade versus announcing a new project. I think that's the biggest issue there.

COMMISSIONER ROBSON: Well I'll ask one last from me. On reconstruction following natural disasters, I think there's a view that, you know, for many of these projects it just replaces what's been there rather than building something that might be more resilient against future natural disasters. Have you done work on that?

MR DAVIES: Not specifically, but absolutely. We have to – to quote the phrase – build back better, because we spend so much money – these natural disasters seem to be coming around more and more frequently, and it's not cost effective just to put back what was there, and, you know, and it'll just be repairing it again in five years' time when it floods again. I think absolutely there is a case for when we do build back, making them more resilient to – that infrastructure more resilient to natural disasters.

COMMISSIONER GROPP: What I was going to ask – I know that the private sector doesn't build huge infrastructure projects, but it does do big projects, and so when you're building private sector projects for – what are the procurement processes like there? And are these new techniques and digital techniques, et cetera, used more there? Or do you have to have government as sort of the leader to drive those?

MR DAVIES: I think that's a really good question, Lisa. I think the example would be, public-private partnerships where because the consortium that's building that also has the responsibility for operating and maintaining that for a period of time, they take a lifecycle view of costings. So, when projects are being developed – and this is a great one from a digital perspective, because Building Information Modelling digital engineering, the substantial benefit of that investment accrues during the operation of the asset, because what that does is it makes a whole bunch of information more readily available to make it easier to operate and maintain that asset. It's all about managing information. It's not about a 3D model on a computer screen. But it does cost money to invest and set that up at the start of the job.

So traditionally, unless a client actually specifies that, a contractor will not offer that because there's no substantial benefit to them doing that. But in those sort of PPP's where you're looking at that lifecycle cost, it makes complete sense to invest in those digital technologies, but one of the other barriers, and I sort of mentioned it in the opening just then to adoption of digital technologies. You know, I get asked this a lot. There is no shortage of digital technologies in the construction space. Absolutely not. There's thousands. I get maybe calls once or twice a week from new providers of digital technologies.

All we need to do is look at what are the barriers to implementing those technologies, and one of the biggest barriers is the form of contract that we use encourages hoarding of information – holding of information, because it can be used in claims against someone or to defend a claim from someone. And a lot of these technologies are fundamentally based on open and transparent sharing of information.

So until we remove some of those roadblocks – and the investment decision is another roadblock, we will still be stuck where we are now in 30 years' time. So BIM digital engineering was developed 30 years ago, and yet we still get excited when we see a 3D model on a computer screen which has been, sort of, point 5 down here on a scale of one to 10. We need to look at what are the barriers and remove those barriers.

COMMISSIONER GROPP: Going to, I guess, a lot of the procurement – it's the skills of the procuring agency. I mean they must face barriers in finding people who can, you know, have the knowledge and the skills to get up those – the tender documents, et cetera. So is that part of the limitation? So they stick with what's been around for a long while – so it's risk minimisation in a sense?

MR DAVIES: I think there's two aspects there. Absolutely, I think there's a lot of conservatism in some of these delivery agencies. More from a point of view of, you know, the finger pointing that will go on if something fails. We're too afraid to fail in the infrastructure space, and I guess there's a good reason for that because, you know, there's safety considerations as well. But I think there's room to do a lot more in that space. But the lack of resources one is a big issue which is why one of our recommendations in this report, Construct or Die, is greater use of what we call enterprise delivery models.

So enterprise delivery models can address a number of problems. So enterprise delivery models bring together, as the name suggests, an enterprise. So lots of different elements of the supply network to deliver, generally speaking, a program of work. So the level crossing removal

program here in Melbourne could be described an enterprise delivery model. The MRPV suburban roads upgrade project can be described as an enterprise delivery model. And so you only bid that work once.

So you go through the process of selecting your enterprise, your contractors, your sub-contractors, your designers, and you do that once, and you try and keep those people together for a long period of time. So you're reducing tendering cost, but what you're also doing is by keeping those people together, you're maintaining the knowledge on the job. So lessons learnt. But you're also improving outcomes.

So the great example is with a level crossing removal program. What those different teams that were pre-qualified for to do those level crossings, one of the conditions for them getting another level crossing once they've completed one, is that they need to achieve certain minimum conditions of satisfaction on that job. And those minimum conditions get progressively raised as that program of work goes. So you're getting better productivity, you're getting more innovation, you're reducing the churn of people and maintaining that knowledge base on the job.

COMMISSIONER GROPP: So would that be described as a form of relational contracting then?

MR DAVIES: Yes. Usually in those it would be more of that sort of relationship style of contracting, you're right. So more of the – or collaborative style contracting where you – from a commercial perspective, it's usually some form of cost reimbursable, whether it's what we'd call incentivised target cost, or the more traditional alliance-style contracting. But where the parties are actually incentivised, financially, to deliver better outcomes - if they improve on the estimated cost, you know, they're entitled to a share of those savings; similarly, if they go over, a share of the overrun - but what those models also do - back to my point before - is, they take a broader based view of value for money. So they do incentivise improved outcomes on local content, diversity, inclusion, environmental sustainability, all of these other issues that we all know are important, and should be important for government organisations.

COMMISSIONER GROPP: Could you elaborate a bit more on this - I think the acronym is FARE - mechanism? And just - and this is about, sort of, having published ratings of outcomes, and how that would work, and who's going to - how objective are these ratings?

MR DAVIES: Yes, so it would have to be undertaken by an independent body. In conversations with Government, we were asked our views on that, and we're agnostic, really. It could be something that could be undertaken by, you know, a reformed Infrastructure Australia; they're going through the process - a review of Infrastructure Australia at the moment.

But it could equally be done by an existing rating - independent rating body. So you've seen - and one of the reasons for us coming up with this idea was seeing the success of existing ratings schemes, like the Green Building Council Green Star scheme; the Infrastructure Sustainability Council environmental sustainability initiative in the infrastructure space. They have both driven really improved outcomes in the environmental sustainability space. And what we said: well, why don't we take that model, and just add some other key reform areas into there, as well, and track that, as well?

And the other thing I didn't mention, as well as, sort of, shining a spotlight on the government agencies that are doing well and those that are not doing so well: contractors and designers are competitive bunch. They will be seeking out opportunities to be associated with high-scoring projects. So that will be another thing that will put pressure on those delivery agencies to provide those opportunities where they can innovate and do better.

COMMISSIONER ROBSON: So the idea is that it would be a sort of systematic, ex post evaluation, put into some sort of rating, and then the common - that sort of best practice would then diffuse into common practice. Because I think what we've heard from you today is that there's not enough diffusion of - and that's a - - -

MR DAVIES: Correct.

COMMISSIONER ROBSON: - - - thread that's coming out in our inquiry across other areas, as well, but - - -

MR DAVIES: Yes.

COMMISSIONER ROBSON: - - - is that the - - -

MR DAVIES: Yes. No, that's right. We think that the - that one of the main roles that the federal government can play is in that sharing of best practice. And whether that's through Infrastructure Australia or some new body, as I say, we're sort of agnostic about that. But, as an industry, we are woeful at learning lessons and sharing best practice.

And I think part of that problem - we spoke to that enterprise delivery model example - is - part of the problem is that we are a very transient sector, in terms of the people. There is very little longevity of employment, and people move from contractor to contractor, designer to designer, project to project. And when you have that movement around the industry, all of the - sort of - the good stuff tends to get lost. And so we'd need to find a way to address that.

COMMISSIONER GROPP: Can I shift to the - you've talked about white-collar barriers - to some blue-collar barriers, which you said will take much longer to deal with. But - and you've mentioned, in - you know, things like licensing, et cetera, and I guess workplace relations probably comes in there. Could you, perhaps, just talk through some of those issues.

MR DAVIES: Yes, sure. I think - there's a couple of things. For sure, industrial relations - we need to improve industrial relations in this country. We - again, back to the jobs and skills summit - one of the things that I said is that government, industry and unions need to, like, leave behind the baggage of history. There is too much baggage there. There's a lot that we all agree on, and we need to start focusing on those areas of agreement. And this is certainly one of those areas where we can improve. It's not about putting people out of work; it's about upskilling people. And I think we need to talk in those terms.

But I think one of the biggest issues, from a blue-collar perspective, in the actual doing the doing work, is the - back to the conservatism and the prescription that exists in - and how things are procured, telling people down to the last nut and bolt, literally - you know, "This table: it's got to be this thickness of wood, sourced from Ukraine, with that type of finish." You know, there's no opportunity for any innovation there whatsoever. And until we sort of untie those sort of two - the arms that we've had tied behind our back, we're not going to see any - you can't - it's - innovation is impossible in those circumstances.

COMMISSIONER GROPP: So it's the regulations which are input-based, rather than - and that goes across the board for safety requirements, et cetera?

MR DAVIES: Yes, look, I think we've become overly conservative in a range of areas. Not safety, I think; safety is so important. But certainly in the design space, and the multiple levels of design review that we now see on projects that are adding no value whatsoever, but are actually acting as a handbrake on innovation.

COMMISSIONER GROPP: And what about occupational licensing? Is that an issue for you, or was that - - -

MR DAVIES: It is. It is. And I'm glad you raised that one, actually, Lisa. It is. You know, the harmonisation of licensing requirements in this country: it's a huge problem, and a barrier to people moving from - in between states. Why this could not become taken over at a federal level, I don't know. But that would certainly make life a lot easier.

COMMISSIONER GROPP: There is now automatic mutual recognition across some states, at least. Queensland is not participating. But have you noticed any benefit from that, in - - -

MR DAVIES: I think it's still early days, to be honest. Whilst there is notionally that - supposedly - that automatic recognition, what I'm hearing is that it's not quite as automatic as that. But it's certainly a step in the right direction.

COMMISSIONER GROPP: And associated with that is, of course, scope of practice, where an electrician has to do everything. But is that still an issue where you could perhaps have lower - less risky tasks being done by people who don't have the full qualification?

MR DAVIES: At the risk of raising the ire of the unions, yes, I do believe that that is possible, but it cannot be something that compromises safety; that is important. But for sure. And, you know, it's not just in the blue-collar space. One of the things that we've sort of said is, it takes six, seven years to train an engineer, for an engineer to go through uni and to come out and to be ready to act as a site engineer. But that's not to say you have to wait six years for them to be useful. In the legal profession, you have the concept of a paralegal. Why can't we have a paraengineer, and a recognition that, at a certain point in time, we can use that engineer to do a number of tasks?

COMMISSIONER GROPP: And while you said, you know, migration - skilled migration is not the answer to the issues at the moment, but those barriers still apply to skilled migrants sometimes, as well, when they can't get licences. Is that something you've come up - - -

MR DAVIES: Yes, it's a huge issue. I was just at an Engineers Australia lunch yesterday, where this came up. There's - and again - an interesting - some good work being - happening here in Victoria, where they're looking to put skilled migrants on internships until their skills and qualifications get recognised. So, rather than having them driving Ubers around town, waiting for that to happen, they're actually out, practising - doing what they're trained to do, and adding a whole bunch more value, until that recognition comes through. And I think that that is a great scheme, that we are certainly advocating other jurisdictions to look into.

COMMISSIONER ROBSON: You mentioned a national partnership agreement. I mean, in your view, what should that include, and what should it look like? Big question, but have you got any thoughts?

MR DAVIES: Yes, well, I think - it is a big question, but I think it's a simple answer. I think the government has got to take more interest in how that money gets spent. I mean, the current iteration of the national partnership agreement has some requirements in there around Indigenous content and compliance with the building code. Well, the building code has just been decimated now, anyway, so that one's out. Indigenous engagement: sure, that's - that's a very worthy requirement to have. But why not have some stipulations in there about improving productivity, about reducing embodied carbon, about improving diversity and inclusion in the industry? You know, it wouldn't be hard to do, and I must admit, my background is not from association world, government world; it's contracts and commercial, for the members I now serve. So I struggle to understand why a Government would not put pre-conditions on how that money gets spent.

COMMISSIONER ROBSON: Thanks very much.

MR DAVIES: Thank you very much. I'll leave - - -

COMMISSIONER GROPP: Anything else you want to - - -

COMMISSIONER ROBSON: Yes, anything you want to say?

MR DAVIES: No, other than, as I say, just to reiterate, I think the construction sector, I'd love to see the construction sector have a far bigger billing in your final report, appearance in your final report. Thanks.

COMMISSIONER GROPP: Thank you.

COMMISSIONER ROBSON: We'll just take a short break for about five minutes and then we'll get the next (indistinct).

SHORT ADJOURNMENT **[10.21 am]**

RESUMED **[10.28 am]**

COMMISSIONER ROBSON: Okay. So we'll get started again and I'd like to welcome our next speaker, David Foreman. David if you could state your name and your affiliation before you start and then we'll hear an opening presentation from you. And then we'll get started on the discussion. Thanks for coming.

MR FORMAN: Thanks. David Foreman, I'm the Director of Government Relations and our Director of Industry for TechnologyOne. And thank you for giving me the opportunity to present. If you can indulge me for a few moments, I might explain why the software company thinks it's got something to say to you. I think we've actually got a bit of an optimistic story to tell about what's happening and perhaps could happen more quickly.

TechnologyOne is an Australian software business founded 35 years ago, still headquartered out of business – out of Brisbane, sorry. We provide the ERP software, began providing financial software for business. That expanded to a full ERP Suite. One of only a small number of companies in the world that provide that full suite enterprise-level technology. Given that we've been around for 35 years, we've been through a lot of iterations of technology. We've survived those by virtue of reinvesting 20 per cent of revenue year on year in R&D. The technology has completely transformed from green screen technology through graphic user interface technologies, and now in the last few years we've transitioned entirely to SaaS, or software as a service.

Over the last few years, as we've transitioned to software as a service, a number of our customers have transitioned with us at different rates. There are now very few that are on premise. Implementations of our software. But some obviously were quicker in making the transition and moving to our natively-written SaaS software and others. A few years ago, what our - our CEO, having heard a number of anecdotes from some of those more forward-leaning customers, came to the business and said these customers are telling us stories about how the software is changing their business in the most fundamental ways; what could this mean for - on a national level?

What happen more broadly? So you'll have to throw little questions like that across the fence to us. We commissioned two economic consultancies, Inside Economics and IBRS, to go out and examine that question. What they did was then to look regionally and across a number of verticals, local government, government education, intensive assets, or critical infrastructure, health community services, and financial and corporate sectors. Examined what were the technology mixes in each of those sectors, looked in each of the regions of the states and territories of the country at what the industrial mix was in each of those regions, and asked the question what would happen were there to be an uplift, a diffusion of these new technologies more rapidly over a 10 year period, a three-year transition across all of those sectors, across all of those regions to this new generation of technologies.

And they did that by virtue of a literature review of about the last 15 or 20 years of global literature around the experience of transition to SAS, and then a series of 68 in-depth discussions with organisations who had made that transition asking them on a kind of no free lunch basis what you can identify as areas where you've made savings. And not just our technologies, but across all SaaS technologies. They then modelled that up and estimated the total value across a 10 year period, the total value to the economy of the potential savings which they calculated at $224 billion over the period in net present value, and then they ran that through the Monash multi-factor regional GE model to model up the second order effects which they calculated in the 2030, that being an uplift of GDP base of 1.3 per cent which - we asked them to go back and make sure that they were confident because they're pretty big numbers, and they came back and said they'd taken the most conservative estimates at all points.

The thing that really caught our attention, though, was - and that validated our conviction that there was something going on here which was more than what we'd seen before as we transitioned from one generation of technology to another was that within that $224 billion in direct savings, 32 per cent of it was reduced total cost of ownership which makes sense. You don't have to buy and run the kit yourself. 54 per cent of it was labour productivity gains that the organisations had realised, which presented at an enterprise level in all sorts of different ways, but to us demonstrated that there was something bigger going on here.

So, his next question over the fence from - the CEO's next question over the fence to us was go find out why people aren't acting in their own interests, then. What's stopping them? This is the original research report. That's my dog-eared copy. We've spent the last - we were interrupted by COVID. Our program of releasing this and going out and having discussions has been a little bit more piecemeal than we originally intended, but we have spent from the release of this report in August of 2021 until now - we have spent our time going out and speaking to communities of stakeholders and customers and end users both to understand what it is that they've experienced more deeply, but also to understand what it is that they had to do to get to the point where they made that leap in technology.

We think - we don't think we've got all the answers. We do think we know enough to have made a contribution to - in response to the second of the Commission's papers in this process which was a really - I thought, a really good and deep paper that spoke to some of these barriers about slowing diffusion of technology. We've got some views around some of those issues, and we think that there's potentially a role for government based on what we've seen government do successfully in the past that can not only act in the interests of government agencies and governments overall themselves, but also drag through broader changes and the kinds of things that we have focused on are patterns of government becoming better and more informed buyers, and also things that government can do by virtue of their market power as on the demand side to effect changes in the supply side. Happy to leave it there if you want to ask some questions, but I think those are the two - for me, the two areas of focus. And as I say, we're trying to engage

discussion. We don't believe we've got all the answers, but we think we've got some insights that are perhaps helpful.

COMMISSIONER BRENNAN: I just wonder if it's worth expanding a bit on that.

MR FORMAN: Yes.

COMMISSIONER BRENNAN: I think that's exactly where we'd be interested in going. The headline question, why aren't businesses acting in their own interests.

MR FORMAN: Yes.

COMMISSIONER BRENNAN: But, secondly, to what extent is there a role for government either because there are barriers that are regulatory or cultural or whatever.

MR FORMAN: Yes.

COMMISSIONER BRENNAN: But - and particular if it is the latter, yes, does government as exemplar or government as - - -

MR FORMAN: Yes.

COMMISSIONER BRENNAN: You know, where government is a regulator, for example, does the uptake of a technology solution sort of drive digital uptake even in the regulated community.

MR FORMAN: Yes.

COMMISSIONER BRENNAN: Or whatever. Do you have a bit of a - if you could expand a bit on that. Where do you see the scope for - - -

MR FORMAN: Yes.

COMMISSIONER BRENNAN: legitimate government action that drives uptake that isn't, you know, too intrusive.

MR FORMAN: Yes. We think that there is a regulatory question, but this is one of the things we want to explore further in another piece of work, and that's around the - whether auditors and regulators are all equally informed about the nature of technology. So, for example - and this is often at the enterprise level as well in government agencies. We, for example - software as a service is interesting because it changes a little bit around the perception of what scalability is because you're providing an application as a service rather than hardware as a service.

When we had the first adoption of cloud-based infrastructure, it was often spoken about a scalable up. What's interesting about software as a service is it's scalable down. So, to take the most - in my opinion, the most powerful example of that is cybersecurity. Probably a little over two years ago we achieved assessment against the IRAP cybersecurity process of federal government assessors being suitable to store data up to and including protected level classified data.

We uplifted all of our agencies to that - all of our federal government agencies of which we have 80 - all of them to that level immediately at no extra cost, and then we introduced the same architecture across our entire customer base, because not only is that the right thing to do, but it's actually more efficient for us. So, we've got some cost to get that, but then operating it on one platform is more efficient. The interesting question becomes, though, when you get to a large agency - so, our larger agencies would include the treasury, department of prime minister and cabinet, department of agriculture, forestries and fisheries or fisheries and forestries, one or the

other. They have a level of internal expertise to go through the process of satisfying themselves that their whole use of the application meets the cybersecurity on them from the government.

Smaller agencies benefit from exactly the same uplift in what we provide, the people in their organisations maybe pretty - much more difficult to access. Much thinner on the ground. Much lower level of expertise. It might be someone who's doing this who's trying to be a cybersecurity expert while doing historically everything else. So, the questions that they're asking may reflect documentation that speaks about infrastructure as a service, not about software as a service. Larger agencies can get that, and they can adjust their expectations on us.

Smaller agencies might find that harder, and so a piece of research that we're discussing doing now is to understand what it is that the regulatory agencies, the auditors and the cybersecurity organisations are providing down to those levels. So, that's a very long way of saying I don't have the answer, but we think there is an issue there to be explored. Is it the major issue? I don't think so. We're usually able with a bit of effort to help those organisations certainly with regard to cybersecurity, to help those organisations to understand in fact they get into a better place, even though the questions that they're asking can't be answered in the way that they expect them to be answered.

Other issues, though, go to the level of - the degree to which technology still remains siloed at the senior executive level. Again, we see a lot of this present in problems around cybersecurity, but it happens at all levels as well. In fact, at the buy side, through the buying process it's probably a little bit worse. Senior executives tend to seek their advice from domain expertise in their technologies sectors more, and rely on it more unquestioningly than they would in other parts. That would be as an example that I use in one of our - in the second paper.

We could all kind of have a bit of a guess at what the real cost of owning and running a car is because we've got one, and so we can by extension have a guess at all of the costs of owning and running a fleet of cars, and compare that against someone who makes an offer that says I'll just provide you with a car service. Executives aren't good typically at understanding all of the costs that are embedded in their business of running on-premise technology to support on-premise applications.

And so often - as I've said, this paper found a 32 per cent saving in total cost of ownership. We'll often have conversations with people who have absolutely no visibility into areas of cost that we know exist in their business in running technology, but they don't know those costs are even there because they're so embedded and washed through and difficult to identify.

COMMISSIONER ROBSON: Take us through some of those costs and examples in an organisation like that.

MR FORMAN: Licensing for technologies that might be used to integrate different applications together to a technology. Costs to take an application and make it available in a mobile - on a mobile device, all of which would be for an integrated SaaS-based ERP or those would be either available through the integration part through repeatable tools - out of the box tools - or which are a function of the nature of the technology itself, that - for example, our technology is available in its full suite of functionality on any device because it's natively browser based. Technology that's based on an on-premise application, if you want to try to make that available externally there are a whole bunch of other technologies that you've got to layer in between to take that and make it capable of being rendered and used, and usually only a much thinner level of the function - part of the functionality.

COMMISSIONER ROBSON: And are there any - you mentioned this 24 billion figure.

MR FORMAN: Excuse me. Yes.

COMMISSIONER ROBSON: How is that in your results - is that broken down between sectors and are there any sectors where it was particularly large savings available or is it, you know, uniform or - - -

MR FORMAN: It's not uniform, interestingly, in that - especially in the way that it breaks down between total cost of ownership and productivity gains. So, for the health and community service, the total cost of ownership savings were quite meagre compared to a lot of others, but that's because they have historically under invested, so to such an extent in technology, and so they have such a long way to catch up. The flipside of that, though, is - and again, this was exposed a few years ago through the cybersecurity incident that affected the National Health Service in the UK where the national health service in large parts of it were completely brought down by a cyber attack that exploited vulnerabilities in some very old Microsoft operating systems.

Some of them are so old that they had been decommissioned and not supported by Microsoft anymore. But under investment in those technologies caused that massive problem. So if you - that under investment is typical across a lot of industries, and health and community service is one that's been heavily exposed to that because obviously if you choose between spending a dollar on a patient and a dollar on a machine that seems to be working, they put the dollar on the patient and the machine will just keep churning along. And very often what we're finding is there was a - one of the events that I mentioned that we hosted to speak about this - CIO of a university in this roundtable said he was highly motivated to move to this technology because he could see all of the downstream productivity gains that were being realised by other universities. To persuade the board, though, he warned them about cybersecurity and the fact that they had this - a risk that they could not mitigate, and that risk was enough for them to make an investment only to realise later that this thing more than paid for itself. So, again, finding that point of leverage with executives is one of the things that we're exploring.

COMMISSIONER GROPP: David, can I take you - I'm not a tech person, but - - -

MR FORMAN: Neither am I.

COMMISSIONER GROPP: In your second submission to us, you - I'll call it a more concrete example about potholes, and about local councils adopting - - -

MR FORMAN: Yes, it's a great story, yes.

COMMISSIONER GROPP: But I'd like you to sort of perhaps elaborate on that.

MR FORMAN: Yes.

COMMISSIONER GROPP: But also it was more than one council, I understand.

MR FORMAN: Yes.

COMMISSIONER GROPP: So how did they come together to agree to share costs, et cetera, and how did - - -

MR FORMAN: So, each of those councils have done it independently.

COMMISSIONER GROPP: Okay, okay.

MR FORMAN: The council that did it first is one of those that I was speaking about earlier that has been really forward thinking in adopting the technology. So, the story is that they use our

asset management system that's integrated to all of the other parts of the finance system. So, that is available remotely. You could go out and you could log something on your phone as a fault, and it would go immediately into the system. What we did, though, is partner with a little company based out of Brisbane called Retina Visions who had developed a technology to stick a little protocol-based camera on the front of garbage trucks, and this could be just something as cheap as the cheapest phone with a video capability.

And stick it on the front of the truck which is driving around the streets every day. The technology is able to identify defects in the road or in signage or on the curbing. Identify that through some sort of smart AI, triage it through the same smart, and continue to learn through the same sort of smart AI technology to say, well, that pothole might be bigger, but that one's deeper so that one's going to cause more damage if there's rain. Our system's IP's IP, so data is data coming into our system. That camera sends that triage information into our system which goes into their core enterprise software, issues work orders against that list of priorities which goes to another device to the people whose job it is to fill the pothole so that when they come in, in the morning, they can go out and tell them go here. It can be an image, a location, they can take a photograph and close the job, go from side to side.

I was unaware of this, but an enormous proportion of the telephone traffic into councils is people ringing up saying there's a pothole in my street. And so much of the saving has been getting ahead of that. A similar example - - -

COMMISSIONER GROPP: You said it went from council to council. I'm interested in how?

MR FORMAN: We communicated it.

COMMISSIONER GROPP: And you – you, okay.

MR FORMAN: And so because a lot of our – we have very large customer base in local councils, I think. About 73 per cent of the population is in a council that's served by our technology. So we've been able to introduce that little company and its technology into a number of councils which, I mean, and it's obviously a great story and there's a next sort of phase of the development of that technology is to experiment in whether we can go into – which is where the real money is going to be I think the real savings - into ducts and pipes. Pipes above the surface of buildings and drains. Because the technology's completely agnostic as to where the data's coming from as soon as it hits that system.

And that's where the sort of techy bit that captures the imagination is the camera on the front of the truck, really smart. The real power is in resolving the defects with no one touching it until someone's got a shovel on the site. And all of the paperwork, or all of the human interaction from the person picking up the telephone at the council to having to send an email or filling in the form to someone, the old ways of doing things. All of that is smoothed out. And so when you hear those examples, you start to see where the 54 per cent comes from.

COMMISSIONER GROPP: So the companies presumably they would be trying to sell their services as well, but you think it – the confusion came more from – you had to be a practiced and more - - -

MR FORMAN: The fact that we – the fact that we had an existing customer base, that was their target market – made us an attractive partner to them – the fact that they could add value to our system, made them an attractive partner for us. And there are others who are doing similar things. But as I say, I think the story of the real value is a whole end to end business transformation process.

COMMISSIONER GROPP: Thank you.

MR FORMAN: The other issue that we have – just to skip onto another point – the other issue that we have been forced to think about is what we're talking about here is this transition from an own-operate model to a consumption-based model fundamentally. The business model that – excuse me – sits behind how we did business was still also in transition. So we used to do what every other software company did. We would sell you a piece of software and we also would implement that piece of software for you, but it's under a separate commercial arrangement. Or you might go to another party and they would implement it for you. And so there's a completely separate activity.

If you go to a third party and this is where I think many of the horror stories around technology failing to meet its promise and projects blowing out really stems from. If you think about the incentives for software companies, incentives for software implementation company and then incentives for a company that might be supporting that software, it might be three different entities. The company implementing the software has got a massive incentive to offer you a price, a low as possible price to get in the game and then to extend that over time and if the project takes longer than expected and you're still paying, what's the disincentive to that? It's only what you built in the contract to start.

The incentive for us as a software company is to get you up and running and telling other people how great our software is. The incentive for someone who's – as we say, feeding and watering the software. Keeping it running on the infrastructure, is to keep themselves in a job. So those guys at the end, are the guys feeding and watering software, running on a – someone else's hardware somewhere. They've got an incentive to discourage you from going to a SaaS service because they're threatened. That's all provided as a SaaS service. It's pure consumption.

The next – and I think that's starting to – I think businesses are starting or enterprise are starting to get their mind around that bit. The next bit though is and we were guilty of this as well, because we were charged twice. We were charged for implementation and for the – and then this ongoing consumption cost – this really came home to us when we were dealing with a very large Federal Government agency that wanted to go from on-premise to SaaS. And they understood what was at stake and the benefits of it. But they said to us, our problem is, we haven't budgeted for it and can't budget for this bubble where we've got – we can't retire all of those other bits of hardware, all those other licenses, because they're running your application. So we can nominally say that bits gone, but it's - they're running all these other applications as well.

So we're paying for your consumption software. We're paying for the implementation and we can't retire any of the costs. What we did with that organisation was we kind of water bedded it along the period. Just say in first year, they would pay no more than what they were paying just before the license fees associated would be on premise software. And we scaled it up over time. In effect, we said to them, we will subsidise your digital transformation to get you to a point where you can realise the value of turning off some of those other things, but that's kind of on you. We will take the hit up front.

What we're now starting to do is to say, that's a little bit hard for them. So why don't we treat the cost of implementation in exactly the same way as we treat the cost of R & D as being imbedded in the subscription. And then the risk is on us if it overruns. Because our path to profitability is that much longer. So in order for us to do that there's some other kind of benefits that are emerging for the customer as well which is our incentive is to get things up and running as quickly as we can. So we identify the parts of the software that are the most immediately valuable to the customer and we put those in under this one price model which means they're

getting that time to value shortened really quickly. And if we mess up, it's on us. The cost is on us.

So that we've only just announced that in the last month or so and we're calling it SaaS plus. But I think that potentially is really transformative of the supply side. And again, I think that's where governments can start to – we did what we did with that large agency because they were a big customer that was important to us.

Government's collectively, if they're able to be less prescriptive, what they come to market for, less prescriptive in the way they expect to be charged. I think they can start to say to software or technology providers, 'Well, what can you do for us?' You tell us what you can do. Put a bit of imagination to this. And I know that that's very difficult, because it – Governments like to have very, very precise documentation when they come to market. And again, sometimes possible outcomes get lost and they get lost in the translation.

COMMISSIONER BRENNAN: So on that, David, you think there are some success stories in the ICT procurement world as a result of SaaS? I mean, this has bedevilled you know, Government ICT procurement is kind of nightmarish and in part because of the constant threat of cost overruns, delays, auditor-general's reports, you know.

MR FORMAN: Yes.

COMMISSIONER BRENNAN: All that suite of things. I mean, have you got some examples of where you see some success stories of SaaS kind of taking a bit of the heat out of that traditional procurement?

MR FORMAN: Yes. So the example that I gave you of the large agency was our first foray into really sharing the risk. The – we operate in the UK as well. And we have signed some first couple of customers to the SaaS plus model in the UK already. So even before our announcement of this, we did that in the UK with – I think it was a university customer or a council customer. But I can come back to you with more. I can take that on notice and come back to you with that if you like.

Again, this is really nascent stuff for us and it's really challenging for our business model. But ultimately, it's addressing things that technology has to address because that – switching costs are massive and the risks around switching based on experience loom very large in the minds of everyone, but especially government. But how we address that, those issues, really will be a determinate of whether this – the diffusion can be accelerated. And so that's – and that sits fairly and squarely, I think with the supply side to use its imagination but it needs a bit of a prompt.

COMMISSIONER GROPP: What about your private sector customers? Are they at the same – well, they have got risks that need to be managed too, are they more open to that or how do you manage?

MR FORMAN: Most of our – the verticals in which we operate are government or public sector or associated with public sector, so – but yes. If you look at airports, you've got a lot of airport customers. And it's a huge issue for them. We've not started yet. I don't think we've signed any airport customers to this model because we're rolling it out in a way that we can manage internally.

But there's no question that a lot of discussions that we have is not just about the merits of technology, but – okay, that's great, but how are we going to stop me from being here in five years saying to you, okay, I can pay for five years and now it still doesn't work.

That again, it's part of the issue is whether – if you have a completely separate agency that – agent that's doing the implementation then you've got to think about how you're going to manage that but there's the idea of – like that – inevitably resolves into really complex contractual negotiations to say here's the risk that I'm willing to accept and then if it all goes to custard, then there's years of litigation around what the contract factually says. So the way we've tried to do it through the contractual obligations on either side, hasn't – it hasn't worked, has it? We can see it doesn't work.

COMMISSIONER ROBSON: And you've recommended it being a sort of introduction of a SaaS first policy across Government. Are there other jurisdictions in advanced economies where that's been done?

MR FORMAN: No. Well, not that I'm aware of.

COMMISSIONER ROBSON: what does best practice look like?

MR FORMAN: Not that I'm aware of. But again, I've been around technology government space for a long time and I remember that when we took a long time for us to get Cloud First, implemented as a policy even though other jurisdictions had done it. But it has had exactly the effect that we'd argue it would have, which is – all it does is causes an agency to have to go if they wish to refresh their infrastructure. They have to ask the question, would I be better acquiring that infrastructure as a service and buying the tin.

And in almost every case now, it's not even the question anymore. Whereas if you go back 10 years those – when the policy was first introduced, there was an enormous suspicion and resistance and nervousness about that. And that's also had a knock on effect into the private sector. So for me, the – it's not a novel policy concept that I'm speaking to in SaaS First. All we're saying is if you're looking to refresh an application, you should first ask the question is this available as a SaaS application and if it is, why wouldn't you do it to – to cause some of those people who are resistant to change, often for very good reasons, but perhaps borne out of some ignorance. To cause those people to go out and answer that question, 'Why wouldn't you do it?'. That will shift the mindset and what you'll find is to be fair, most of the – most of our Federal Government customers or those 80 customers, I think, all bar a very small number of our customers, and I'm talking about a number of five or six, have transition to SaaS.

And those five or six, there are a couple who have got very, very specific security agents which we'll go on to address. So it's not so much our – we've kind of done our bit with the application and the journey – the companies that – the agencies are on the journey. But there isn't that systematic perspective that they take that says from where we are, this hybrid world now we expect to be in a world that's almost exclusively SaaS. They're still looking at application by application.

COMMISSIONER ROBSON: Take us through the cyber security is a huge issue ordinarily and even more so at the moment, are there specific cyber security issues associated with SaaS and then also privacy issues as well compared to more traditional forms of software?

MR FORMAN: Yes. Historically, again, going back a decade or so we were first arguing about Cloud First. There was a resistance to the idea of well, I can't see that piece of tin, therefore, it must be less secure. I think there was a really pivotal moment in about 2019 when the Australian cyber security centre provided advice. I think they called it anatomy of a cloud assessment, something like that. Where the introduction to that advice to agency is – was words to the effect of before you – when you start making a decision, that whether to go cloud, you

need to ask yourself whether you can manage security on the premise. And what they were really saying was you might think you've got this, but you don't.

I think that really changed the thinking of a lot of executives who were able to say to their ITSs, 'Are you sure about this,' so that was important. What we've seen subsequently at – you're right, the risk of cyber security is – and I've seen some visibility of this for a long time, is the risk is growing and the activity's growing explosively and has been for as long as I can remember. And I had hoped to bring one of my colleagues who is responsible for our SaaS platform, but he isn't available.

Speaking with him recently, he said the number of – sort of scanning events that we see on our platform now, has increased just in the last few months, 100 fold or more. There are thousands of people just scanning, looking for vulnerabilities every minute. The – from a decade ago until now, the – it's no longer any doubt in my mind that cyber security defences are – is a scale gain. A scale gain but one where we've got to be more educated about what the shared responsibility is between you and me. So I can make available to you, the ability to manage the administrative rights for your software. But if you give away your username and password to someone, that's on you, not on me.

We've kind of got to work together to lift that education posture while we're doing the technology thing on the other side. I'm not sure whether that answers your question. Did you have any - - -

COMMISSIONER ROBSON: It was more around the differences in terms of cyber security between more traditional forms of software acquisition. So own operate and install one side versus software as a service and what if I had the - - -

MR FORMAN: Own operate? It's all on you.

COMMISSIONER ROBSON: Yes.

MR FORMAN: It's on me if I find a vulnerability in my software to say to you, hey there's a problem. Here's a patch, come and get it. It's over here. Come online, find it. I'm telling you that it's there, put it into your instance of my software, but that's on you to do and that's on you to make work if you've done something funky in that software as implemented it. That's on you. Now it's on us. If there's a problem at any level of our software, we fix it and we just - you probably don't even know. We just roll it out, and we roll it out to everyone at the same time.

Again, to go back to that NHS example, some of those national health trusts were using Windows XP which was out of support, and the problem was so bad that Microsoft agreed to go back and provide a fix especially for them, but they had had - software was something like 17 years old, and the fixes had been available. The patches had been available for years, but not implemented because what you're trying to do is to make sure that the person who's using the application, which might be a scanner for some device - might be running a scanner for some medical device - the worst thing that can happen is that you play with that software and stop it working because the damn thing is worth $4 million, and all of the clinicians are going to be screaming if you fiddled with it and stopped it.

So, it's working. I'm not touching that. I'm going to put my efforts over here, and I'm so busy anyway that I don't have time, and the advice that Microsoft published to say hey, there's a patch; you should put it in. They don't even see that. We have people who just do that. So that's - it's a completely different way of doing business because it's a completely different cybersecurity environment today to what it was even five years ago.

COMMISSIONER ROBSON: Do you think that would make some potential adopters nervous, though, in the sense that - I mean, I can see the benefits, but then, you know, just then saying from an organisation - so I've now contracted out cybersecurity as a service.

MR FORMAN: Yes. Yes.

COMMISSIONER ROBSON: Which may happen anyway, but do you think that's a potential barrier to more widespread adoption of - - -

MR FORMAN: It has been, and again, that's where we see there's a potential role for government to say to a provider like us who's serving government, you need to attest to these standards, and we'll keep lifting those standards, which they do through the ISM and other means. You need to attest to those. We have IRAP assessment every year. I think we're required to do it every two years, but we do it every year, and we're continually getting - we have a rolling, I think, six firms coming in trying to do penetration tests so that we know that we're always going to meet that standard.

And while that - and we - and the IRAP assessment is available only to government customers. But as I said, that's - our entire platform is architected to that. So every other customer is dragged through, and the more that they become educated that these things exist and by virtue of the fact of this kind of reverse scalability thing, that they're going to benefit from every dollar we spend over here for the Department of Prime Minister and Cabinet means that a small St Vincent de Paul is benefiting from the same thing, the more that they can have reliance that we do have - that we are providing a level of cybersecurity that they would never really be able to match. Thank you.

COMMISSIONER ROBSON: Thanks very much. Have you got anything that you want to add at the end or - - -

MR FORMAN: No. Look, only that we are - we're continuing to - as I suggested, to try to find ways to dig more deeply into this both through those kinds of immediate interactions and also through potentially other pieces of work. We're doing a piece of work with one of our government customers in New Zealand that we've just kicked off. This was really valuable to us, but by nature of the fact it was arm's length, it's all completely anonymous, so we don't know who's provided these examples, but we're working with one of our government customers in New Zealand who's just starting on this journey to map the before and after picture which again we want to communicate. So much of this is about agencies being able to see the benefits that others have received and said I want what they've got.

COMMISSIONER ROBSON: Thanks very much.

MR FORMAN: Thanks. And of course we're open to any other - if you've got any questions on notice, please, we're dead keen to participate in any way we can help. Thank you. Thanks.

COMMISSIONER ROBSON: Yes, okay. Have we got them online? Can you hear us, Vicki?

MS THOMSON: Loud and clear.

COMMISSIONER ROBSON: Okay. So, welcome. So if you could just state your name and the organisation that you're representing today, and then we'll hear from you an opening statement, and then we'll begin the discussion.

MS THOMSON: Excellent. So, Vicki Thomson, chief executive of the Group of Eight universities, and I'd also like to introduce Dr Philip Chindamo who is our chief economist who is also available for the tricky economic-type questions that I'm sure you may have. So, I might

just - if you can indulge me, I've just got an opening statement which I'd like to make, and then we can get into questions. So, thank you very much for the opportunity to set out very clearly our strong views on this vital subject. We have the greatest respect for the Productivity Commission's intent regarding this matter, and it makes the Group of Eight universities that I represent both enthused and relieved that finally the criticality of what we do within our universities and, in particular, our research-intensive universities is being taken seriously as a central driver of Australia's productivity.

And here, of course, I refer to R&D, innovation, and of course education. These areas are really at the heart of what the Group of Eight through our graduates, our researchers, and our commercialisation teams can and do deliver. And I don't say it lightly that, frankly, we believe Australia cannot deliver the productivity growth it must do without us and the broader university sector. Our submission to the Productivity Commission combines the expertise of economists from across our universities, seven of which are ranked in the world's top 100, and there's no argument from our leading economists who contributed to this particular submission that Australia and, indeed, nations around the globe are facing significant economic challenges.

Australia's research-intensive universities are committed to being part of the economic solution and, indeed, we strongly believe we're integral to that solution. I don't need to tell you at the table that productivity is the only long-term factor driving living standards. We know that long-term productivity growth relies on innovation and human capital. Australia must invest more in knowledge creation and human capital if we are to have profitable and innovative businesses, secure high-wage employment, and address challenges such as an aging population, climate change, and national security needs. And this is core to a future Australian economy that is more diverse, complex, and robust as will be demanded to be successful as a nation into the 2020s and beyond.

Our submission sets out recommendations to boost productivity growth and put Australia in a very strong position to face the challenges ahead. So if I just deal with research first, because that's our very strong area of focus. Investment in R&D is critical and will deliver substantial economy-wide returns, yet R&D investment has been patchy and our research effort is moving away from the all-important basic research. It is, we believe, simply unacceptable that Australia lags behind our competitor nations by so much and has done so for so long. It casts a pall over any chance of being a more sovereign nation or of every Australian having access to the living standards they should expect from what was once known as the lucky country.

Basic scientific research is a key driver of innovation and productivity. Innovations don't occur in a vacuum; they rely on basic scientific research, as we've seen recently with the rapid development of COVID-19 vaccines and a plethora of other examples. The IMF in examining post-COVID-19 pandemic strategies for boosting long-term growth highlighted the critical importance of basic research, and I quote here: 'Basic scientific research is a key driver of innovation and productivity, and basic scientific knowledge diffuses internationally further than applied knowledge.' Importantly, the IMF found that a 10 per cent increase in basic research is estimated to lift productivity by 0.3 per cent on average, and it also says that basic scientific research in advanced economies is underfunded. So, to gain any productivity momentum, it therefore appears logical that we must change what has occurred in other areas of the economy over past decades while at the same time involving the Group of Eight and research intensive universities far more in the recovery process.

The Federal Government's share of total R&D has been in decline since the mid-nineties and business is also moving away from funding research. It gives me no pleasure to criticise business, the business sector, but it frankly deserves some criticism. Since 2008, the GFC

period. Business expenditure or BERD on R&D as a share of national – total national R&D fell 10 per centage points by 2020 to 53 per cent of total R&D expenditure.

And as our submission sets out, business has been and continues to walk away from funding research and it's universities which are picking up the slack. And it's particularly the Group of Eight universities, because we undertake 70 per cent of all university-based research in Australia.

So in contrast to BERD, that business investment, HERD which is the higher education investment, as a percentage of GDP, has risen from 0.54 per cent in 2008 to 0.61 per cent in the survey conducted by the ABS in 2020. And that's significantly higher than the OECD average of 0.44 per cent of GDP. It might surprise you to know it certainly did surprise me, that in Australia, the Group of Eight universities alone, just the eight universities, almost meets the OECD average for higher education spending on R&D, or HERD as we call it, as a percent of GDP.

That lopsided commitment is not good enough by anyone's standards, we believe. It should also be noted that government is commissioning national research from universities while only paying for less than half the costs. So that requires universities and again, primarily my universities, to support the national research effort using their contingent funding and that is mainly international student fee revenue. Again, that's not good enough. We are recommending the adoption of a full economic costing model, bespoke to the Australian context and one which reduces the reliance on cross-subsidies from student fee income.

This decoupling is important if we're serious about building sovereign capability. COVID-19 has shown very clearly how important industries can be disrupted due to a range of external factors, not of Australia's making. So the key question we need to ask ourselves is this. Given the criticality of an active and high quality R & D sector to Australian prosperity, are we comfortable allowing this to be reliant on external forces that lie beyond Australia's control? Expenditure on HERD is beneficial from an economy-wide productivity perspective. For every $1 billion invested in Group of Eight university research, an estimated additional in-year economic output of 9.2 billion is generated across the rest of the Australian economy. And that's not us saying that. Those figures come from an independent assessment conducted by the highly respected firm, London Economics, which we will be releasing in the next few weeks. The Federal Government has set a target to lift investment in R & D expenditure to 3 per cent of GDP, obviously very challenging in the current economic environment but strongly supported by the Group of Eight.

A national research strategy is recommended by the Group of Eight in our submission which targets spending where it delivers the greatest return and best targets national priorities will support that goal. The strategies should prioritise funding for basic or Blue Sky research, improving incentives for universities to conduct basic research, support industry and university collaboration on R & D, support access to the international collaboration of funding, such as Horizon Europe, which is the world's largest research fund run by the EU. And review the R & D tax incentive scheme so that it truly incentivises collaboration.

Also critical to productivity is a skilled and educated workforce. Obviously nothing can be achieved without people. You'll note that in our submission, we propose abolishing the Job-ready Graduates scheme. It was out of touch and unrealistic when it was introduced and frankly, it's highly questionable whether there was any depth behind the reasoning or rationale to its introduction.

All that has succeeded in doing is damaging future productivity growth by erroneous funding focus and denying what is required for the nation's good. The Group of Eight raised concerns

about the previous government's Job-ready Graduates package from the outset. We said it wasn't fit for purpose then, and the recent National Skills Commission report has more than confirmed that. The JRG actually acts as an impediment to skills creation. It creates disincentives for universities, particularly in relation to STEM courses such as engineering and IT which we know are already experiencing critical shortages.

We have been required to teach more with less. Our own internal Group of Eight estimates at the commencement of Job-ready Graduates indicated that by 2024, Group of Eight universities will be expected to teach an additional five thousand equivalent full time students with a decrease in base funding of almost 100 million dollars. Frankly, in the current climate, we cannot afford to waste our time and limited resources on models or policies that have proven to be ineffective.

Therefore, once again, the Group of Eight recommends that the JRG be abolished in favour of a much simpler model for university teaching funding by having a fixed student contribution and a commonwealth contribution to reflect the variability of qualification costs.

In closing, I just want to emphasize the importance of the Universities Accord which this government has committed to and I understand that will get underway before the end of the year. We think that that's an absolutely fantastic opportunity to address many of these recommendations, in partnership really with the work that you're doing with the Productivity Commission. We think there's an opportunity to (1) look at genuine funding reform, so Government and tax payers get the best value; (2) to review the current legislative and regulatory barriers to productivity and; (3) to develop a university sector that can meet the 21st needs of Australia. We think with the right policy leaders, universities can and should be leaders in our productivity revival. And now, happy to take questions, expand, comment and as I said, please note that I've got Dr Philip Chindamo, our chief economist who's really been the driving force behind the development of this submission to the productivity commission.

COMMISSIONER ROBSON: Thanks very much, Vicki. I just have a few questions and if Lisa's got some as well. Now, you mentioned spending on R & D as a metric. I mean, that's a measure of inputs, effectively. But I guess what we're interested in from a, you know, an economy-wide perspective is the output that you get with those inputs. Do you have anything, you know, where you can directly measure those outputs per dollar spent? Because ultimately you know, if we could reduce spending but have more output, that would be, you know, productivity enhancing and cost reducing. So take us through some of your thoughts on that.

MS THOMSON: Yes. So you're talking about the tangible economic output of research as opposed to the actual output impact of research, which has on our everyday lives, like developing vaccines and all of the things we do. You're talking about, I think I mentioned in my statement, you know, the investment in research and the dollar return that we get, or the economy gets as a result of that input. That's what you're referring to, right?

COMMISSIONER ROBSON: Well, I'm just saying from a policy point of view, is it, you know, appropriate, or is it the end of this story, just to say well, we spend less therefore, we should spend more? I mean, ultimately, I would have thought what you want to be emphasizing is the fact that well, you know, we're spending you know a certain amount and here's what we're getting. And you know, to take - - -

MS THOMSON: So the – yes.

COMMISSIONER ROBSON: Yes.

MS THOMSON: So the first thing I'd say is that first of all, any investment in research is exactly that. It's an investment from government as opposed to an outlier. You know, because they are getting a return on their investment. And Philip, I might ask you here just to go through some of the data that we've had, which we haven't released yet, but from our London Economics analysis which, just to provide some context for you, London Economics did an economic impact analysis for the Group of Eight in 20 – was released in 2018 based on 2016 data. We've updated that and we're about to release that. It's a very economic analysis of our output, but what we've done is actually looked at the 2020 year, which is obviously the first year of COVID, so you've got to ameliorate some of the figures that really – the impact has really hit us probably in 21, 22 and beyond. And we specifically wanted to look at our economic impact in a broader economic context on both research, but also on innovation, start-ups, spin-outs, commercialisation, because whilst I focussed in my opening statement on basic research, our universities obviously do a lot more than basic research, we're actually significantly large in terms of industry engagement and in that sort of commercialisation start-up, spin-out area where obviously we employ – those companies employ people, et cetera. But Philip, can I ask you just to maybe got through some of those figures?

MR CHINDAMO: Thanks, Vicki. And thanks for the opportunity. So yes, London Economics have undertaken a study for us that looks at the – I suppose the outputs or the productivity impact of expenditure on R & D and in particular expenditure on higher education R&D through the Group of Eight universities in Australia and those estimates suggest that for every billion dollars of expenditure, there's an economy-wide productivity return of $9.2 billion. Now, that study is based on econometric evidence of the productivity spill-overs after you account for obviously the costs of the money and also the different types of expenditure. So whether it's BERD, whether it's expenditure on research institutes as opposed to universities, and the like, so it controls for those other factors. And so we're not simply saying that because R & D expenditure is relatively low, that it simply should be increased as an input measure. We're saying that that expenditure has productivity-wide benefits in terms of outputs and outcomes.

And that's the key argument that we're putting forward in terms of the R & D strategy. In terms of the quality of Group of Eight universities research, as Vicki mentioned, we are rated world class by independent assessors. And more broadly, Australian universities in terms of overall performance relative to the OECD, we bat well above our average in terms of the quality, the output of research per capita as well as our university and industry collaboration on things like applications for patents and so forth. Australia is well ahead of like countries. And so we see that as a promising area to further improve on, so in our submission, for example, Chart 12 shows university and business collaboration on patents and shows we've performed relatively well.

COMMISSIONER GROPP: Philip, can I just come in there? So, just on that payoff for the 1 billion, that's quite a large return. Is that for an additional, is that the marginal return or – I mean, because that's very important to know if that – how much more would be worthwhile putting into basic research. And I'm just not sure what that figure is telling us.

MR CHINDAMO: Yes, it is – sure. It is the marginal return. We acknowledge and we understand there are quite a wide range of estimates in terms of productivity spill-overs to R & D expenditure. We've obviously looked at what the Productivity Commission itself has estimated over the past which has been quite a wide range. But we've also looked at what internationally those estimates have been as well as domestically. So for example, we looked at the CSIRO estimates, they were studied, and looked at R & D expenditure, not only university expenditure and they had various estimates in there ranging from a benefit-cost ratio of 3.5 to over 20. So we acknowledge that's a big range.

But our estimate is – I suppose it's in the middle of the various estimates that we've looked at and we think it's a relatively conservative estimate.

COMMISSIONER ROBSON: And so is that analysis, is it – I think you mentioned, is it economic impact analysis or is it cost benefit analysis? Because those two things are very different. What do they – do they sort of do a welfare analysis or is it just sort of multiplies or what is it?

MR CHINDAMO: Yes, it's based on an econometric analysis that looked at the estimated productivity spill-overs and it does take into account the costs – the financial costs from the Government of that expenditure. And so it looks at that as well. So it's not a full cost benefit analysis. It's a mix of essentially economic impact analysis where the calibration of the multiplier is drawn from econometric analysis.

COMMISSIONER ROBSON: Okay. All right. And then is there a sense in that modelling or you know, is there a thought experiment that could be done, you know, in our innovation paper, we do talk about the diffusion of you know, existing ideas and adoption and adaptation of ideas as to form of innovation itself as distinct from R & D. Is there a sense in that modelling where you know, you could say well, if we improved the diffusion of R & D spending, you get an even bigger uplift? Is that something that you can do with that modelling, do you think or what should - - -

MR CHINDAMO: We haven't directly addressed that in the modelling to date. We're focussed pretty much on the R & D expenditure. We do have a section that looks at – if you can broadly define difusion from our Group of Eight universities spin out companies. So these are companies that have taken the IP from a Group of Eight universities and developed into businesses and the like. The data on there is quite, I suppose, preliminary in the sense that a lot of these companies are in their infancy. So they've only started and we're looking at only the year 2020. But we do have some estimates there about what are the employment and revenue impacts from essentially people taking university IP and developing spin-out companies, so we have some case studies as well as some quantitative estimates in that report.

MS THOMSON: It is fairly limited though, because it just looks at Australian based spin-outs. It doesn't look at the international based spin-outs. So I'm not sure, to be honest with you, how robust that element of it is. It's been really hard to basically track down the information to support the output of that.

COMMISSIONER ROBSON: I might pick up on that. I mean, in terms of the spin-outs and so on, are there barriers either in government policy or in other institutional arrangements where, you know, you think that sort of activity could be more extensive? Is there anything that's holding back those sorts of arrangements?

MS THOMSON: Philip, I might hand to you, just to talk about the R & D tax incentive.

MR CHINDAMO: Sure. So in terms of the R & D tax incentive, we've said in our submission that it can be better targeted and we see that essentially, one area that it could be improved is how it's actually facilitates collaboration with university researchers in particular, PhD students. So one area or one limitation for these companies is to tap into our PhD cohorts and being able to utilise their skills a lot more. And so we see that as a reform area through the R & D tax incentive as a way of enhancing that collaboration. We note there are various programs, even some recently announced on national PhD or industry PhD schemes and the like and there are various benefits of those programs but we feel that actually – and what's required is scale in terms of enabling that uptake of essentially highly qualified PhD students from our universities.

MS THOMSON: There's also an issue with just capacity in terms of our commercialisation workforce if you like. And again, to Philip's point about how you scale that, so I know for our universities for example, at the University of Queensland, they in and of themselves which would be the exemplar of university commercialisation output in Australia, earning more revenue than CSIRO themselves, but where they have the handbrake on, sort of growing it, amongst many, is the talent pool of people coming through and building a commercialisation workforce to support the training and you know, the commercialisation process, if you like, within our universities and in industry.

And so I think, you know, I've been around the sector now, for two decades, and we've had this discussion for two decades around the sort of lack of porosity of movement between PhD students and industry and I think part of the issue, and it's not sort of a – it's anecdotal, I guess, but – although, you know, Australia's industry base is largely made up of SME's. We don't have the big corporates here. We don't have the big corporates doing in-house research which is why we're doing 70 per cent of Australia's university-based research. That is higher than in other countries. Universities aren't normally that research intensive because you've got those industry partners. So the nature of our economy makes it very difficult and one of the things that we have been trying to do which is probably out of the domain of this, but it does go to the heart of what Philip mentioned in terms of how do you scale it, is trying to see which industries are taking our PhD students and tracking our PhD's over sort of the five, 10, 15 year timeframe to see whether our PhD students are actually in businesses or industry, doing what their PhD was or whether they're doing something different. Which also might be okay. But it's actually really hard to get a sort of – you know, a grasp of that particular data. So there's a lot of work to be done there, but in terms of the specific answer and how you scale, because there are some great programs happening, in you know smaller areas, the challenge is how you actually scale that up, and I'm not sure, Philip, we have an answer to that, do we, in our submission? No.

COMMISSIONER GROPP: Just on that, because as you will have seen from our paper on Innovation for the 98 per cent, we deliberately focused on - not so much on basic research, acknowledging that that's very important. We weren't dismissing it, but just thought it was time perhaps to put some - shed some light on the diffusion across the companies' enterprises and government enterprises that might be doing some innovation for their own firm at the frontier, if you like. And, yes, I mean, that absorptive capacity for firms and having skills and whether it's PhDs or certainly university graduates who have some research experience, and - but you're saying there's not much data or, sort of, tracking them so we don't really know where they're going, and that would be interesting in itself.

I mean, whether we can get more information. But in terms of the programs that are being run - and there's the industry PhD program which is a relatively new one, and Philip talked about R&D and perhaps - I mean, I guess there are some PhDs involved in those programs, but you'd want a more formal recognition of that to encourage it. But yes, I mean, how do you - are there other ways of not linking PhD so much to basic research in firms, but just collaboration more broadly? Is that something that you look at because we sort of flagged that as one way of improving absorptive capacity in business.

MS THOMSON: I'll let Philip pick up on a bit of that, but I should emphasise that when we're talking about research, our focus is not just on basic research. Our focus is on the whole pipeline, and so a lot of our PhD students are working in industry on collaborative research projects which are not just blue sky research. They're actually in there solving problems, and we've got lots of examples of where that happens. I guess my commentary from my opening statement was that we worry that basic research is kind of being ignored, and if you don't have the basic research you will not have the innovation at the end of the pipeline. I mean, that's just

- there's a continuum there that you can't ignore. I get what you're saying in terms of some firms will just do something, you know, in terms of innovation which is not predicated on basic research, but that doesn't preclude our PhDs. They're not all sitting there just doing basic research. They're doing deep dives, for sure. So - and there are many programs that are run at a very small scale to get our PhDs into industry and vice versa to sort of, you know, have movement across. But we're not getting that level of scale. So, Philip, I might - sorry, I just wanted to highlight that basic research is just not what all we're talking about. But Philip, anything you wanted to add in terms of some of the areas that we did look at?

MR CHINDAMO: I suppose one slight difference to what - if I can put it this way - the Productivity Commission were a little bit sceptical about in interim reports was the geographic colocation of universities and businesses and other, I suppose, organisations. I don't know, Vicki, if you want to talk about some of the examples we have that we think are worth looking at further.

MS THOMSON: Yes. I mean, really - and can I ask you in answering that question - I'm interested in your views, which - we interpreted it as kind of thinking that maybe colocation is not necessarily something that will drive the economic output and productivity of our research. Just before I answer the question, I'm just interested to know, have I interpreted that correctly as to what your views are of colocation?

COMMISSIONER GROPP: I guess where we were coming from was more where you have deliberate policies to engineer it. Sure you'll get colocation and you'll get organic clustering in precincts, et cetera, and that's fantastic, but it's where I think you have a policy, like a planning thing to design it and say that you will - you know, we think these things have to be sort of organic I guess.

MS THOMSON: Yes. So I think they have to be a bit of both frankly. And so if you think about the biomedical precinct in Melbourne, Sydney, Sydney Uni, UNSW, or the health precinct out at Western Sydney with Sydney Uni and Westmead Hospital, there's many examples where the sorts of things that governments can do, particularly state governments, to help that along is, you know, offering tax incentives and all of those sorts of things which they do to bring them together.

And it is a bit of both. I mean, research itself is often a bit organic which makes it very hard, I know, when policy makers are saying, well, how do we put a prescriptive policy together to develop a precinct, you know, in X. But certainly, pulling together SMEs, particularly in defence - if I think I'm in Adelaide at the moment, and I know the university sector here is doing that in a particular area at Lot Fourteen where they're bringing together - there's incubators; there's the universities. Not just the Group of Eight universities. Not just Adelaide University rather. There's defence. There's primes.

You know, once you've got your anchor tenant, if I can put it in that sort of clunky way, the rest will come. So that required input from the state government, universities, federal government. So, I don't think it's a situation of governments saying, well, let's just make it happen, but I don't think it's a situation of government saying we're going to set up this precinct here. It's got to be a little bit of both because it's got to be where the expertise is. And if you look at where our universities are, it is in that biomedical space, in the health space, in the defence space, quantum computing, for example.

So, we've got very good examples of where precincts have worked, basically because universities - if I can of Melbourne and Monash, they just thought, well, we're just going to get on and do it. And so I guess that's a bit to your point, right? Do you let it happen organically or

do you put the incentives around for not just universities, but for businesses and SMEs and primes to stump up and come and collocate and be part of that. And our experience to date with those big precincts is that once you've got that big kit infrastructure sitting there, whether it's the anchor tenant or the universities or whoever it is or it's Thales or Naval or think of it - you know, CSL, then you'll get the SMEs coming in, and that's when you need, I think, the incentives for that scale of the industry sector to be able to come in easily enough without a lost sort of opportunity cost for them in not doing so if that makes sense.

COMMISSIONER ROBSON: Thank you. Sorry, I was going to ask, moving on to a different topic now on the international student fee revenue. I think you mentioned the cross-subsidy. So maybe you can expand upon that in the sense that, you know, do you regard it as a - there's a cross-subsidy there, but is it distorting and, if it is, in what way? And then I think you also mentioned an economic costing model. I mean, what is exactly the size of that cross-subsidy across your members because this is one of the things we grappled with early on was just the idea that perhaps that could be made more transparent and the extent to which you know it is driving you know outcomes in you know in other - for domestic students in terms of teaching quality and so on, but maybe I'll let it to you to expand upon those.

MS THOMSON: Well, I would contest the argument that it's driving outcomes in terms of teaching quality, but that's - we can go to that in a moment.

COMMISSIONER ROBSON: Okay.

MS THOMSON: In terms of the international fees and student fees cross-subsidising research, this is not a new phenomena and it's something that we've said probably for the last seven or eight years at least that I've been at the Group of Eight that we have operated on a very distorted funding model with government investment in research has declined and universities, particularly ours, have picked up that slack if you like by funding research through international student fee revenue.

And whilst a level of cross-subsidisation in any business model is perfectly fine and it happens in other businesses, and if we look at us as businesses that's what we are - whilst that is appropriate, it's the level of cross-subsidisation, and if I'm frank with you I think we've now ripped the band aid off if you like thanks to COVID because when students stop coming, then we always knew what the problem was, but we understood what the problem was not just for universities and research output, but for the broader economy, and you would've seen that in terms of CBD impact, et cetera. Skills crisis et cetera not having international students here. So this is not just about the role of international students at universities.

It's the role of international students in an economic context for the broader economy. And that's something that we've never really wanted to speak about before because - for a whole lot of reasons which I don't - I'm sure you understand when we're talking about international students. They're more than cash cows, and the risk is that that's how they're seen. But getting back to our universities and our research, so we have a significant proportion of international students. I think it's one in three international students who study at an Australian university are at our Group of Eight universities. That's an indicator of our quality, frankly, and it is very much a demand driven system in terms of students coming. And during COVID, we actually maintained our share of our largest market, which is China, albeit that we were teaching online for, you know, we still are teaching online for the majority of those students who still can't get here. But from our perspective, it's not sustainable to fund the national research effort based on international student fee revenue.

So, if I look at it globally – and I'm now using not the 7.2 or 7.3 billion dollars we spent on research, because I'll use the 6.3 which was our last figure that I had – I think our cross-subsidy was around about 4 billion. And Philip, you can correct me if I'm wrong, but it's around about $4 billion that we had to find. We get about two and a half roughly – and I can give you these exact figures – from government industry, other sources, but primarily there was a gap or around $4 billion, and most of that came from international student fee revenue. Around 6 to 7 per cent came from philanthropy – we've got a very small philanthropic base here in Australia compared to our competitor nations, US, Canada, et cetera. So most of that comes from our international student fee revenue. So, you know, I'm not an economist, but I don't have to be one to know that is not a sustainable operating model.

So to your question about the full economic costing model, if you then also park that but dovetail it with the way we're currently funded through our NHMRC ARC grants, which is partly – about half of the funding we get covers the cost of our research. We have to go and find that money from somewhere else, so we go and find it from our international student fee revenue in the main. There is industry money, et cetera, but in the main, from that source. So if you have a full economic costing model, what you're actually doing is you are funding the entire cost of that research project.

So what the government calls indirect costs, we would assert very strongly that they are not indirect costs, they are the direct costs of research. It's your kit, it's your electricity, it's your people, et cetera. That is not an indirect cost. It's a direct cost of doing that piece of research. The natural consequence of full economic costing, which is a model operating in the UK – and that's why I deliberately said an Australian context full economic costing model – is that you will do less research, but it'll be better funded. So that research will be funded.

So these are the decisions at the policy making level that government needs to make – and it's why I made the point in my opening statement about research priorities and targeting your research funding from government to where those research priorities are. And if there's, you know, we want to do research in other areas, well that's fine, we go off and we find money to do that from somewhere else wherever that might be. But in the main, if we're doing research, which is essentially commissioned by the Australian Government which we are doing the bulk of, we need to ensure that we're doing that in the areas of national research priorities to be defined – that's a constant conversation – and that we're funding that research through a full economic costing model.

So this is not – and I should have maybe said that at the outset to your first question – of course we'd always like more money – but our first starting point is not just throw more money in the pot and everything will be fine, it's actually how do we better target the funding that we've got? Because we're nothing if not realistic. We know that there's not, you know, there's not money to be thrown into a pot which is why we're really focussed on how do you get to 3 per cent of GDP, because that will help us get to a better funded research model in Australia.

Philip, I don't know if there's anything you wanted to pick up on that that I've covered off.

MR CHINDAMO: No.

MS THOMSON: Or correct me on anything.

MR CHINDAMO: No, that's fine.

COMMISSIONER BRENNAN: Sorry, Vicki, it's Michael Brennan here. Just to be clear about that though, I mean, that account that effectively says government – you know, because of the limitations of government direct funding of research – that is, as a consequence of that we

need to go and seek out revenue from international students, that's how we fill that research gap, kind of implies that if government did magically come along and say, "Yes, we're going to significantly boost ARC and NHMRC funding," we just wouldn't have as many international students or we'd charge them a lot less? I mean, is that plausible? That universities would sort of tamp down on that and say, "Yes, we don't need that revenue source anymore, government's come to the party." I mean, is that your contention?

MS THOMSON: No. So you kind of – there's a couple of different issues there Michael, because our international students – and this is why – I mean, it's an uncomfortable conversation that I would only have this conversation with the Productivity Commission because we wouldn't refer to our international students quite as blatantly as I have in terms of that revenue source. The fact is, our international students – and it may sound cliché – but they play a significant role, particularly in terms of our soft diplomacy in the region and a whole lot of other things. So I'm sticking to the lane of the economic input-output of students.

The natural consequence from our perspective would not necessarily be fewer students, but it might mean, actually, that you've got more revenue to put into teaching or to assets or to whatever it might be as opposed to cross-subsidising it into research, and I also don't think we'd ever be in a situation where there wasn't some small cross-subsidy because I don't know of any multi-billion dollar business - in some cases with our big universities like Monash, Melbourne, Sydney - where there wouldn't be some cross-subsidisation. I mean, that's just a normal business model, right? It's the level and extent and the reliance that we have which we've seen throughout COVID – thus my reference to ripping the band aid off – when students don't come and they vote with their feet and they go elsewhere or they just don't come, that is a major vulnerability. Not just for our universities, but for our broader economy.

So, I can't answer that explicitly by saying there'll be fewer students, because I'm not sure that we'd necessarily want fewer students. Not saying we want more students either, but I'm just saying that it's a kind of related but sort of separate dialogue if that makes sense.

COMMISSIONER ROBSON: Okay. Any others?

COMMISSIONER BRENNAN: Just a quick one, I think it's a quick one. Going back to Philip's earlier point about spinoffs and commercialisation where there are case studies of those. I mean, do you have a basic sense of the sorts of sectors that they tend to operate in? I mean, I'm imagining it's probably in areas like energy and ICT and, you know, perhaps manufacturing, that sort of thing, or am I wrong? Is it more broadly based than that where we're seeing, maybe health – you know, where we're seeing kind of spinoffs of commercialise-able IP that sits within a university into a private sector company?

MS THOMSON: It's across all areas. Agriculture, you know, drone technology, health and medical – which wouldn't surprise you – defence, Philip – I haven't got the case studies in front of me, but I can't think of an area where we're probably not in in terms of our start-ups and spinouts.

MR CHINDAMO: Yes. Climate change. There's a whole range. Biomedical.

MS THOMSON: Yes.

COMMISSIONER BRENNAN: And a quick supplementary to that, you talked about the potential collaboration with PhD candidates, scholars, you know, going into industry, et cetera, which is kind of, I guess, thinking about the output of the universities in terms of the students, you know, graduating, albeit these ones with higher qualifications going out into industry. What about academics themselves? I mean, how prevalent is the practice of academics doing some

consulting in industry, you know, including with SME's or indeed, with government, and is that an easy thing to do?

MS THOMSON: So, there's a lot of poaching going on of our academics. So if I look at the IT industry – and in fact, we had a roundtable not that long ago in Melbourne, and part of our challenge with, for example, teaching IT, is not a lack of students as opposed to STEM engineering - our IT deans tell us that they're certainly got demand - it's we don't have enough people to teach the actual IT subjects because they're being poached into, you know, the Googles, et cetera and being paid at a rate that our universities can never match them. So we lose good people from academia into particularly those sorts of companies.

So one of the things that we did discuss with them is how can we make it so that you can still have the expertise, but you don't actually take them from us, so that they can actually still be teaching the students, because we know there's an IT shortage. I mean, this is just one box example.

But there is a lot of movement between academia and universities both ways. So, you know, we have a lot of professional people who come in and teach our courses and we have people who go back. But again, it gets back to this challenge of how do you scale that so it becomes normal operating procedure as opposed to, you know, a few here and a couple of hundred there or a few, you know, here and there. And I think that could be a challenge.

And also we have, you know, I think a fairly – I'm veering into territory that I'm not familiar with necessarily, but our industrial agreements are also a bit of a handbrake as well on our academics, in terms of our teaching research. You know, that kind of crossover that they do. And I know that's a constant battle for our universities in dealing with, sort of, the industrial agreement that we've got.

COMMISSIONER BRENNAN: I mean, we'd be really interested in any information, case studies, examples you've got about where that works well, you know, what some of the ingredients of that success are. Where you feel there is a really rich connection and exchange between academics and industry business – that isn't necessarily of that, to take the earlier example, the commercialisation route. You know, there's some IP here which we're then spinning out, but just the kind of person to person connections, you know, where you've seen approaches to that that appear to be highly successful. What the ingredients of that are?

MS THOMSON: Yes, happy to provide that to you.

COMMISSIONER ROBSON: Vicki, you mentioned – we'll turn now to the question of domestic students and subsidies. You mentioned you know, your analysis of the Job-ready Graduates program and you're advocating, I think you said, a fixed student contribution. Is that an absolute dollar amount or is it the share of costs or what is the - - -

MS THOMSON: No, we think a single – sorry, I'll be very upfront with you. It's a very simple solution, but with a complex kind of calculation that's going to have to get to the Government contribution site which we haven't turned our attention to. So in the UK for example, it's a flat 9000 pound fee for all students. Put aside medicine, so just quarantine that, that's slightly different for us as well. In Australia, I think we've got four, five different clusters and there's funding all over the place, and as I said, it's a total disincentive. It didn't deliver what it's supposed to, for example, it's a net 16 per cent cut in funding for engineering students. If the kid wants to be you know, a lawyer, they're not suddenly going to go, 'No, I'll go and do engineering, because I don't have to pay so much.' It just doesn't work. And I think you've raised that yourself.

So I'm reluctant to sort of put a figure. I can, but we haven't – it's not – with no basis, and no sort of economic modelling or any further discussion other than we think it's an elegant solution, say you had like a $10,000 flat fee, for students, and then you've got to allow for some variability but in a simple way, not the convoluted way which Job-ready Graduates does, where you might just have a high and a medium and a low or a low and a medium for particular courses which takes into account the variability of both delivering those courses and you know, where they are, because we don't believe that necessarily teaching a degree in one university might be the same as teaching a degree in a different university. So that's where I think we're going to get into a very complex discussion with government. So it sounds simple in theory but it happens in the UK and I'm certainly keen to find out how that kind of works from the Government side of things from the UK model. And I think that's where from our perspective, the Accord would be really important to actually pick some of those areas. But yes, a flat fee for students. So please don't take $10,000 as the figure.

COMMISSIONER ROBSON: Yes.

MS THOMSON: But we have just sort of bandied that around, but with absolutely no rationale.

COMMISSIONER ROBSON: I guess then that takes us to, you know, the extent to which whatever, you know, dollar figure you're talking about, would that cover costs and then you'd allege the discussion about, well, what kind of costs and then you'd, you know, thinking about efficient costs and benchmarking across universities and transparency of cross-subsidies which we had a bit of a discussion on and then also teaching quality, you know, so you could have a very low cost solution, but it might also be low quality and some students might be fine with that. Others may not be. So you know, those are the sorts of things that the discussion would, I think, quickly lead to. Have you got any thoughts or reaction to that?

MS THOMSON: Yes. Philip, I might just ask you to pick up here, this – our sort of view on an efficient cost.

MR CHINDAMO: Sure. We understand the concept of an efficient cost and we understand that it's been applied in other areas of service provision and the like, but we really, I suppose, have some issues with that as a content. We don't think there's a homogenous delivery of qualifications between, let alone the Group of Eight universities and the sector, more broadly. So there would be issues as to how you, I suppose estimate the efficient cost of delivering or providing a particular qualification.

And we acknowledge that you, yourself, also point out that there are other factors that have nothing to do with efficiency or productivity that may influence the cost estimate. So we don't think that a unique, efficient cost is necessarily the way to go, but having perhaps a low, medium band of costs as Vicki explained earlier, that then the Government would provide its contribution on those bands, but not the five or so bands that we have now, we think that more simple approach would be a way to go. And we acknowledge that if you did go down the efficient cost path, it would require a lot of data and a lot of modelling for each individual university and again, if you choose the medium cost, what does it necessarily do in terms of incentives or disincentives. It may not necessarily improve things dramatically.

COMMISSIONER ROBSON: For some of your members, I think we've had examples where, you know, the students have satisfaction surveys and acknowledging that the – I've been on the end of those. The - - -

MS THOMSON: Were you satisfied?

COMMISSIONER ROBSON: No, no. Whether students were satisfied with my teaching. But you know, so in terms of measuring teaching quality, and then you know, controlling for that and improving it within universities, do you have any thoughts around that? Because at the end of the day, I mean, teaching quality, you talked about human capital investment, you know, that is one of the key drivers of students getting a good course and of course, the problem with, you know, a service like universities is the consumer may not be aware of the quality going in. They may not even be aware of the quality going out and they may not realise until much later, the quality of the education that they've received. So you know, how can we incentivise better teaching quality within universities in terms of measurement and improvements in that sense?

MS THOMSON: So this is a vexed issue and one that exercises us, because we know where we sit on QILT and it's kind of, you know, not where we would want to sit. We sit high up on everything else and then on quality indicators we take a hit. And so our universities – we are exercised – in fact we've got a meeting tomorrow to discuss partly this very issue, because every time a QILT comes out, we're sort of somewhere down the bottom, and yet we're high quality universities with, you know, and there's a whole lot of things that go into that, of course. The cohort that you attract although that can't just be the reason, and I accept that, but we attract a particular cohort of students, but we want to be able to attract a very broad group of students who will come to the university because they think they're going to get a good quality education. And then we look at all of our other indicators we've had, you know, the highest retention rates, the lowest attrition rates, the best graduate employment outcomes.

So if you look at those three measures, and that's all above the national average, if you look at those three measures, we're doing really well. We're getting them in, we're keeping them there, we're teaching them and they're getting a great job in the main. And so there's some sort of lack of correlation between the experience that they're telling us and then the output that they're having and they're staying. So I don't have an answer, other than to acknowledge that it's a vexed issue and one that exercises us and one that we work at really hard, you know, to address.

I guess, kind of simplistically, you know, I look at Monash University with 82,000 students. It's kind of ironic that we are elite universities, but we're huge universities with the exception of ANU. You know, average of sort of 35, 40,000 students and then some of the universities that do perform very well on those indicators are smaller universities, smaller private universities who have got a capacity perhaps to reach in, in a way that we don't for those surveys, you know.

So I mean, again, it's anecdotal and we kind of are exercised around how and why and it has been that way since I've certainly been with the Group of Eight. So I wouldn't want to leave here with you thinking, that, 'Well, we don't care because we're really good quality, so they'll come' because that's certainly not the issue. And there is an issue with students, even if we were to assert that we are very good on teaching quality, if the perception is we're not, that's a problem.

COMMISSIONER ROBSON: Do you think part of the answer, thinking more broadly about the system, is to allow, you know, teaching only universities or encourage that in whatever way possible, or you know, more along the lines of a US style, you know, liberal arts colleges and so on, or is that not the way things should be done?

MS THOMSON: So I have to say this is probably more Vicki Thomson speaking as opposed to the Group of Eight. Don't take this as a Go8 position. But we do discuss it. And I think this is the point with the – this process, the Productivity Commission process which is why we put so much energy into this and also the Accord process, is that we have to have those discussions about whether or not, is that the answer? To have teaching only or community – more community colleges, you know, a greater variety of offerings. Greater seamlessness between

you know, post-secondary, whether it's through from vocational education and training into universities.

And certainly the provider category standards which is basically what we are working under in terms of what our standards of categories are, I think without putting words in Peter Coaldrake's mouth, is that's where they were sort of heading. By putting a threshold on the quality of research you do, over a period of time, because you know we have to do research as part of our sort of legislative definition, but if you start to ramp up the quality of research, those universities that, you know, may be doing a small amount of research, still high quality, but could be a very small amount of research, may be better placed, focussing on teaching, where they're really good at it, but we don't kind of put the same focus on that, I guess.

So at the moment we're trying to be all things to all people and I think the provider category standards is trying to drive us to that point of a discussion, and I think this report, your report and the Accord process is where we need to have that very honest discussion within the sector about what that actually means. Should we have 39 comprehensive universities all doing teaching and all doing research for example, or do we look at a liberal arts kind of model that the US has? I don't know the answer to that, but I think it's – we're long overdue for a debate. We haven't had reform to this sector since the Dawkins era. So that's 40 years ago. We're a very different country now than we were 40 years ago and so we – and more of the same obviously, isn't sustainable.

COMMISSIONER ROBSON: Okay. I think we're out of time, so thank you very much.

MS THOMSON: Thank you.

COMMISSIONER ROBSON: Is there anything else that you wanted to add?

MS THOMSON: Not from me. Philip, anything from you? No. And we're happy to come back and we'll certainly provide some of those examples. I think Michael, you asked for in terms of the examples of that movement between universities. I'm happy to come back at any time.

COMMISSIONER BRENNAN: That'd be great. Thanks, Vicki, and thanks Philip. Good to see you again.

MR CHINDAMO: Thank you, Michael. Bye.

COMMISSIONER ROBSON: Okay. Moving on. Yes? Okay. So I'd now like to welcome David Chung. I think he's online. David, if you can just state your name and your affiliation and then you've got an opening statement. If you can present that. And then we'll continue with the discussion.

MR CHUNG: Okay. Yes, my name's David Chung, as mentioned. And I'm from a company called Knowledge By Design. But the submission, I'm actually giving you guys, is actually from a business of ours just starting up, it's like a start-up within our company called 88.io. It's a bit tough to come in at the tail end, but I'll try to do my best to keep you guys entertained so you don't fall asleep after so many hours of hearing.

COMMISSIONER ROBSON: Thank you.

MR CHUNG: Okay, but I think it's probably sound really interesting because all through the path today, you see that from the hearing from what I term as top-down type productivity enhancement. So what they do is really about set up some policies, the government look at them, like some of them, push down to industry, industry then push it down to the consumers.

So what we have been doing and how we started was because we're looking at the COVID problem, so there's a big problem with COVID and Echo and Google actually have this solution but it does not – it's not powerful enough to actually isolate where the virus is.

And on the other spectrum, all these contact traces which the Government employed, they try to isolate and they'll try to find where it is and again, because, I'm not going to tell you where I am, minute by minute, and neither are going to be a lot of other people. So it's a big privacy problem here. So there's this gap between the Apple and Googles who can see everything, but legally, they can't actually disclose. And the Government, who doesn't have the capability to actually isolate them. So what we did is we cover these technologies, it's actually it has been in research for a while with IBM. Homomorphic encryption. And somehow if you believe that you enable us to both give the Government the visibility and also protect the privacy of the citizens. So that's where it started, as a solution for COVID.

But as you guys probably know by now, COVID is gone. Well, the death rates still quite high apparently, but except in China the lockdowns are gone so probably be useful in China, but anyway, so that's how the whole thing started. Is to give this ability while preserving privacy. In terms of the distance very useful in boosting productivity in a lot of areas. Personal productivities or – are final where I've been and how many times have they used the toilet, how many times have I wear a pair of shoes, so this sort of – well, I – can I call it situational awareness could be very useful, not just for health reasons like for COVID and stuff, but you know, I won't be wasting my time or money, no understand for that – if I knew that I've got an extra pot of milk in the fridge et cetera. So this is the general comment on what it does.

Now, you guys are into policy, so you putting things down, so what this guy doing is, what I'm trying to do is to have tools that actually try to push it up by giving people this ability. You'd still find it on our site that we actually increasing productivity in certain ways. COVID is one of them. So Scomo got a Dr Alan Finkel who did this contact tracing report and Dr Finkel said that look two days is the gold standard of contact tracing and we need to our simulation with our contact tracing through the citizens that actually drop it down to about two minutes.

So that's a fairly massive increase in productivity. In more recent cases, Medicare and Optus, when they got hacked, and I think Medicare was about 10 million customers. So if you go this traditional way of actually Medicare coming going down and telling customers hey, you've got to be careful and look out for the next year or two for any suspicious transaction. That's going to be extremely unproductive. Whereas if you have all these – if you use our technology of the bottom up, where everybody would be tracking and logging their ID in a secure way. Protect their privacy, whereas telling the bank who they are, then again, there'll be a productivity gain.

So the idea is actually to increase productivity in (indistinct) which of course is a personal one, then there's Google industry, it's very interesting. Well, I didn't catch many of these hearings. I caught one from **JON DAVIES**. And he was mentioning this morning about – oh, we got tons of digital technology and we've got so much technology. If (indistinct) technology's not a problem. The problem is actually data and my – what we're trying to do is to open up that data that was previously locked inside, Google, Apple, Facebook and return it back to the consumer. So they can get time to do it back to the Government or back to themselves, their families, their business. So the idea is to actually free up that data that is available. About where **MR DAVIES** did this morning, managed to go look, it's all locked up, you know, inside of and stuff like that.

Just because there's no incentive to actually – for people to share and once this been done, it actually that's good incentive for people to share information. I'll give example. In there, we

have this Coles and Woollies. So one of my colleagues was saying, 'Hey look, what sort of privacy policy is it, if Coles can see Woollies data?'

The idea is this. You've got all these loyalty points, you've got all these things, so data is logged up in all these silos and you can only access it. So you know, Woollies have their own – own data, Coles have their own data. But if I'm a customer, I can now make money by selling my data, say to Coles seriously, I don't know, I just bought 2 bottles of milk from Woollies. Suddenly Coles will have access to Woollies data. Not from their loyalty points, company, but data from customers.

And customers – that they'll be collect themselves can then be used not just to fight COVID but to increase the general well-being of themselves and also make some money by selling them there. So they are now a producer of data and they are also now – they get income from where they sell to Woollies or Coles or for the competitor. But they're the only one with visibility across everything.

Now, I'm not just talking about competitors in supermarket, it is a – across – across industry. So I could be Uber. Now, Uber actually got a lot of data, they've probably got more data about road conditions than use of the Transport Department but what happen now is if I'm the consumer, I will be in that Uber car, I will be in that New South Wales train or the ferry. So suddenly all this data will then be available to the department of transport or whoever to make use of it. And I'm trying to make a point that – in the submission I mentioned about IMF – about the problems with data, and I believe that their problems that IMF was concerned about is because of these big providers holding the data and grabbing the value of the data and then slowly dishing them out.

So we are like a free market economy, but say, compared to China, we just, like, let more control. But unfortunately, our data is not really free. They're actually all hold up into these big companies, and we are now innovating at their pace or innovation at their rules, right, or where they can make money.

So that is a major problem where the economy on the surface is free, but underlying, the data is not. The data is actually locked up and it's being controlled by these big cloud platforms. And that's actually a problem for most cloud platforms. I do not have time to look at the other – listen to the other hearing – but a few of them actually, like – I think one of them is actually NDIS. Some sort of ticking and helping people out and stuff like that.

So all these cloud platforms sounds good initially, but basically they are holding data and they are actually setting the rules. So they are not that productive because it's very hard to innovate within a platform because they've got their own board of directors. You know, they've got their own way of doing things for their profit. But whereas with the bottom-up, the data is stored with the citizen, it's up to me to decide whether I want to give to Coles or give to the Productivity Commission or give to the New South Wales transport department.

That is the major difference between the top-down type of policy where you just set up regulations and say, "Hey, you do this, you know, you do that," as opposed to something like this where the citizens themselves have the data and they are the one who give that – whether it's to Coles or to whoever. And at all levels – it's not just personal, but you know, industry level, even government level. We're finding potholes, for example, right. We were looking at lot of rain in Sydney and there are a lot of potholes on the road, so now people will get rewarded if they ring a number 13113, and then they can say they see pothole and then keep driving. And then all this data belongs to them. Whoever say pothole will have the data stored under their own asset as an information asset. And the next person who see the same pothole will get added,

and if there are six of them, then we are pretty sure that it's good enough to warn the other drivers there's a pothole in front.

So this example of how – I'm not saying pothole will damage productivity, but you know, it's kind sort of action, it probably would effect productivity somehow. But this is just the way in where people are working together, storing data themselves instead of on the platform, it's going to help a lot. Especially in big spending.

That's right, this morning I think one of the commissioners was questioning Jon and said, "Hey you know, so we built all these, what about the maintenance costs, you know, of maintaining it and how do you do the trade off?" "I'm going to spend so much on say a submarine, should I swap or not swap?" The focus of this is just consumer feeding back to the industry. So in this case, say defence, it'll be the consumer feeding back to the government and say, "Look, you know, we're really getting hacked man, from this country. You should do something about it." So we have many - the feedback between a consumers back to producers, but it doesn't stop people between producers and producers to actually share its information as well, as long as we can use the same thing to track how that information is flowing. And that's the whole idea of this thing is to compensate people for really minute things. Like helping out with a pothole or answering a question on the street, et cetera.

So by knowing the data sometimes before you decide on a submarine, you can get a much more better feel of the geopolitical situation. Just one case just down here, the local government decided to block our road, so we say, "Hey look, please don't block it. We want cars to come through," and the council decided to block and we said, "Look, how many cars are coming through this road for the past year?" they cannot give us the data. So it was something like this. Who knew exactly how many cars come through the road, what kind they came through. It will help both the council and us.

Now, because the government against nobody, of course they win and the road got blocked now, but the problem is if we cannot use our data it can effect infrastructure projects way, way, way in the in front. Before the whole – look, there's been studies – even get started, look, they'll know exactly where to actually do the thing. If we knew, okay, look, there are really 10 cars only per day, then I'll just shut up and do nothing. But that uncertainty is going to create problems.

Another thing – it's about **VICKI THOMSON**. We just heard in that last bit as well. She made submissions about universities, and again, it's a top-down thing. So I have to be – I'm a (indistinct) as well, I came through there, but the thing is the whole syllabus and stuff like this is very, very top-down. So take a look at, you know, what's happening. For something like this, you know, literature, that's probably okay, but for something like high-tech, even though the entrepreneurs – not many are really PhDs. You know, they are really people who actually learn through necessity. Not through policies, not because, you know, someone offered a course, but they didn't really need to.

Now, by pushing computing, this is what we are going. It's a crossover of an offering to everyone - whether it's a billionaire or a refugee – by doing that, we believe that they can then innovate themselves not at the quantum level, but at the everyday level. Right. So I'm going to do this to increase my communication with that guy. I'm going to broadcast with someone. That can be done. You don't need coding. You don't need to teach them coding, but you do need to teach them how to mix and match all these blocks, and that's what we are offering, this ability to mix and match blocks for people who are not really computer literate.

So it's very fine grain. I mean, my degree was really tough – was an engineering degree, but I learned so much rubbish. Not rubbish, they're useful, but they're not really applicable to

computers. I was learning about generators and hi-fi's and stuff like that. But imagine I could use all fine grain and I can just learn right there as I need to. One fit person on YouTube right, is probably giving Australians a lot of skill upgrades. I was going to YouTube to learn things. They have published (indistinct) because that is not a traditional channel, not a top down channel, that's the same on demand channel that we are talking about now where I'm giving everyone with just a mobile phone - $49 from Woolies – that ability to control their digital environment. And I think that is the difference. Once they control that, they will not go to uni, but they might learn to innovate by just mixing and matching.

One of the programs we have here is actually training up AI. So, say, retirees, they're probably bored from the afternoon, they can sit down and actually train. But unlike what they're doing at Google and Apple, these retirees who are getting money for themselves because the training they are doing actually goes inside their own - what we call part of the cyberspace – and then they can then dish it out to, I don't know, maybe Coles, Woolies or maybe back to Google if they want to use their ability to train. The whole computing environment has changed now.

It's not how smart you are, how much code you do, with AI the killer is actually data. And the promise – all of this data being concentrated in – well, they are foreign, I guess, in Google and Apple and not in here. We really need to just get the – this data belongs to the citizens. It really should be back to where we are and then let us decide whether I want to give it to the government, or Coles or wherever and not have no say. I don't think that is an equitable way of distributing access or even wealth, and this is getting worse and worse every day.

Okay so sorry, I've just dragged on – I apologise to the commissioners, but that's the idea. So data is a major economic input and we really should cherish it and use it, and I think that improvement in the liquidity, the ability to share data will help all industries. Whether it is, like, construction or education or whatever.

Okay, the last point. We have been trialling this in New South Wales. So if you go into our system by just 88.io, you will see many new – we have Australian maps and also American maps as well – overseas maps. But only the New South Wales one is really high resolution. And I have to praise the development here, because unlike other states, the New South Wales government really followed through in the open data policies. So actually, as a nobody I can access detailed overhead photos of the whole of New South Wales. So I can now pinpoint exactly where a person has entered a pub and transmit a virus to someone else. I cannot do any of that with any other states. I have to pay and I have to go through a really big process. So here, the government of New South Wales is ahead in terms of giving us, the citizen, this open data to access these offerings. And if you go there now, you will see that New South Wales is much better in terms of resolution or locating where you are.

Okay, and also one – okay, now, I better don't – it's technical there. I have to apologise for this sort of incoherent thing. We were looking at going to VCs probably next month or so. And government is the last place we're going to visit. After everything is gone then we're going to go to the government. But because there's a time frame here, we thought this was important enough and is mature enough to actually tell you guys about it.

So at least you can say, look, something like that is there. It could improve productivity in the opposite way. You know, for the citizen standing in the street than government. And it's something that you guys should be aware of. It could potentially improve the productivity of all the people who have sent submissions in. The situational awareness or just data visibility will help. Most people just think, "Look, I've got extra data I'm going to, you know, analyse more," but one thing not many people know about is that it gives you extra options.

So if you know about something, there might be a way – it's got nothing to do with, like, productivity, as in, I can optimise my company ability, it's about to get you thinking about extra options available. And sometimes one piece of data may change, you know, a person's life or even, I don't know. Whether Iraq or Ukraine will happen, but if they can see that clearly, they might oppose. And by freeing up the data and letting people own their own data again instead of hogging it in the cloud, yes, I think that would improve the productivity a lot. Yes.

COMMISSIONER ROBSON: Okay. Thanks, David. Sounds like an interesting technology. Did you have any questions, Lisa?

COMMISSIONER GROPP: I don't know whether you're aware, there's a consumer data right which has been rolled out in the finance sector and other industries where companies – where people can access their own transaction data essentially. But what you're proposing, you wouldn't have to get it – you'd generate your own data. Is that right?

MR CHUNG: It'll be in parallel, so if you deal with a bank, they're going to grab the data so you can't do that. The main difference is now people – imagine a refugee here, because the difficult part of what we managed to do is we don't really need to be a billionaire, so anyone could grab the data. So in your example, they will have the financial data at the banks, but the difference is you will now have your data. And guess what, you will have data of Westpac, National, across everything. And that data you can now sell. Now you can do it for free to government as part of a taxation arrangement, but, you know, you could also sell to commercial people. But the difference is you are not grabbing a duplicate copy.

So we are not replacing – I think this is very important. We are actually giving you reliable ability, because most things is – if I want to do something like that, you'll say, "Oh my goodness, if I lose the mobile or you know, if my home got burgled, they're going to steal all my data." The main innovation here is that the phone is actually just your keys. All your data is actually shared – like in my case, in my in-laws, you know, in my friend's locations. So if you don't trust me – your data to be stored – distributed, you know, in many other people's places which you know, like, really your friends or your employers or whatever. So I'm talking about duplication of capability, not a replacement of what was there.

COMMISSIONER ROBSON: No questions? Thanks very much, David. So, ladies and gentlemen, that concludes today's scheduled proceedings. And just for the record, is there anyone else who wants to appear today before the Commission? All right. If not, I'll now adjourn the proceedings and this concludes the Commission's public hearing for the Productivity Inquiry for today and for the inquiry. Thank you very much.

MR CHUNG: Thank you.

COMMISSIONER ROBSON: Thank you.

MATTER ADJOURNED [12.34 pm]