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CONTINUES FROM PART 1

Gaming Platforms: Servicing and Community

And there are now *3 billion people* looking to gaming platforms for entertainment, community and achievement.

These systems are more than entertaining experiences but mainstream health therapies and servicing platforms.

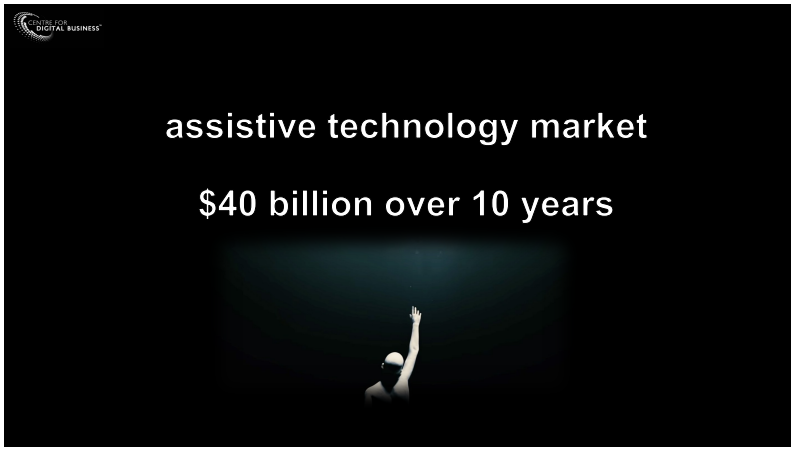
By leveraging the popularity of eSports and gaming, the US Army has driven recruitment to the highest level in the history of the all-volunteer force: far higher than website and traditional recruitment channels

We are seeing dimensions universally exponential *and* personal.

Whether it's the massive US Army – or a borderless world of engagement and global connection made possible for a young man with disability and millions like him.

These immersive, inclusive, Internet of Things environments – have become and are reshaping what we understand to be "assistive technology". And these are radically changing jobs.

Assistive Technology Market



In November 2017, in my capacity as a National Board Director of the Australian Information Industry Association (AIIA), I appeared before the Senate Committee on the Delivery of Outcomes Under the National Disability Strategy 2010-2020.

The estimated $40 billion assistive technology market over the next 10 years is of enormous interest and significance to the Australian technology and innovation sectors – and the Australian economy more broadly.

If, as the Productivity Commission has estimated, the spending on human services is expected to reach $300 billion per annum, the Assistive Technology (AT) market could potentially be around $4 billion per annum.

A much larger market than the $1.06 billion per annum estimated in the 2015 NDIS assistive technology strategy.

And that $40 billion over 10 years is just the Australian market.

But even the massive size of the market potential does not guarantee innovation and growth: culture and attitudes need to change, and I'll come back to this point.

And what cannot be overlooked is the significant global research efforts into the demographic convergence of disability and ageing populations.

Emerging from global R&D efforts underway, breakthroughs in computing power and design are driving the parallel convergence of technology solutions for disabled and ageing populations, with considerable mutual benefit.

The two can no longer be treated in isolation to one another.

And universally - innovations emerging from and for these populations – will benefit all people who in everyday life experience functional or situational disability.

Situational disability is a term used to describe a temporary state imposed by a person's current environment that results in an accessibility issue, such as the inability to use one's hands on the phone when driving.

Commercially, this means that improved features, functionalities and user design are beneficial to all consumers universally and not just for a smaller market segment.

Even if that "smaller" market is $40 billion over 10 years.

Accessibility is THE most significant global commercial opportunity.

And this is why I had proposed the establishment of a "Council of Advanced Innovation" for extreme accessibility in the business case, through which Australia could shape, influence and engage local and global research and development, in standards and technology innovations.

Paucity of Analysis

So given the massive AT market there is a paucity of analysis.

Deep analysis and future casting is urgently needed, to provide essential insight for the sector, on the shifts and possible futures of the AT and innovation industry.

Without this, of what use is financial forecasting on Scheme sustainability?

In a number of Submissions, the Australian Rehabilitation and Assistive Technology Association (ARATA) highlighted two critical points.

Firstly, there is insufficient rigorous research evidence regarding assistive technology.

And secondly, there are currently systemic deficiencies against presenting an ROI of NDIS funded AT over time. Specifically ARATA emphasised the need for...

"...*methods to create a culture of selection of AT based on ROI.*"

And this AT market research analysis needs to be linked to not only a future view of the AT market for products and services – but what the future jobs market looks like.

As I stated earlier, exponential technologies are re-shaping what we understand to be "assistive technology" and the inter-relationship with and the nature of jobs.

Future Jobs

For years, government, industry and research bodies have produced reports looking at "future jobs" and areas of growth and gaps.

Consistently, the two areas with the biggest projected employment growth are health care and social assistance - 38 per cent employment growth in these two categories alone.

The reports estimate that the health and disability care sectors are driving a voracious demand for *70,000* additional jobs in the next few years.

But *70,000* of the same jobs of today – for the future – is a meaningless statement. Extreme conditions change the nature of jobs.

To take a lesson from the Apollo Program which all up, was the collective effort of *400,000* people.

Perhaps the most important “moon shot” job was the production of the space suits that the astronauts would wear in the extreme conditions on the moon.

Many are surprised to learn that in this male dominated endeavour, the people who made the space suits were seamstresses at Playtex.

Bra and girdle material was used to manage the bounce and movement of the human body in weightlessness.

The seamstress jobs are now called “space suit assembly”.

This is one of the most phenomenal examples of how assistive technology and skills from tangential domains radically adapted and transformed for extreme conditions.

What does the rapid adoption of exponential technologies mean for the massive Australian AT market and the disability and aged care workforces?

The dilemma for the fragile aged care system and disability services, is that whilst these are the epicentre of the “jobs growth”, more of the same will not fix the problem.

I spoke earlier about the *3 billion people* globally engaging with the massive online gaming platforms, and how these environments are rapidly becoming mainstream support and therapy services.

Are these *70,000* forecasted Australian jobs and people ready for that world? Not when they are viewed through the mental model of last century.

The 2016 Senate Inquiry into The Future of Australia’s Video Game Development Industry acknowledged the growing demand for gaming innovations in health, education and training.

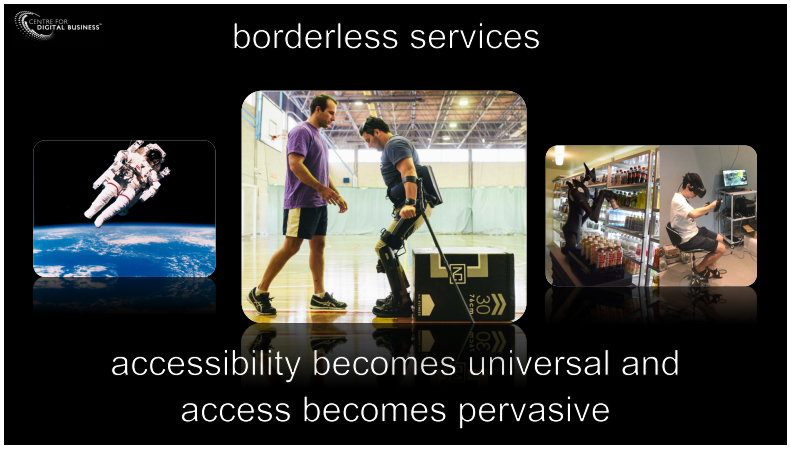
But even with the Government’s National Innovation and Science Agenda, the Senate Inquiry lamented:

"…*it is not apparent that the Government has given explicit attention to interactive game development and the potential for Australia's future that this industry could provide.*"

In my opinion, the core of the aged care and disability *policy* failings – which is impacting current and future jobs preparedness – is a lack of co-design in policy and a political resistance to radical innovation.

A future posture requires more than iterative mostly temporary policy adjustments to get through COVID.

Borderless Services: Universal and Pervasive



Let's look at telehealth.

It's good news that telehealth will now finally be a permanent part of the Medicare system.

But Australia must urgently move beyond simple telephone and video conversations.

In early 2019, the US Center for Medicare and Medicaid Services (CMS), overhauled their policies for new technology to permanently drive and incentivise responsive servicing innovations.

These include multi-modal services such as "virtual check-ins" and remote servicing; and the exchange and remote evaluation of images, videos and patients own physiologic measurements.

Easy-to-use at home devices already exist, IOT, sensors and companies like Apple continue to add health monitoring capabilities to their smartwatches.

So true telehealth - and disability services - for the decades ahead need to be borderless and seamless. Moving beyond the telephone, to a connected services ecosystem where accessibility becomes universal and access pervasive.

Imagine a physiotherapist consulting with patients on the other side of the country by using this digitally connected exoskeleton – as a funded telehealth channel.

This would be life changing for many people and create new domestic and export therapeutic services.

This is an actual example from an exoskeleton NDIS provider of the human impact, time and cost of ***proving*** ROI involved in introducing new servicing innovations for NDIS participants.

ROI in this case is not a like-for-like comparison between a wheelchair and exoskeleton.

And as ARATA stated, creating a culture of ROI – not just "reasonable and necessary" - is absolutely necessary to fully leverage the $40 billion AT market to transform the jobs and skills market.

Can you imagine robots as support workers, monitors and companions in people's homes and in supported accommodation?

Can you imagine a robot training a person with disability, to perform work remotely. And for this to be funded as capacity building as part of a person's NDIS package.

And here we see a robot in a convenience store stocking shelves, remotely controlled by a person in another location wearing a VR headset. This is Japan.

The objective is to enable a person to do any job on Earth from anywhere else.

And the robotics industry is undergoing what has been described as a "...Cambrian explosion of growth...".

The result is that a host of jobs that seemed out of reach for remote work are likely to be firmly in the remote-work orbit within the next 10 years.

And people with disability, as avid gamers and experienced users and developers of these technologies – could translate these skills into remote work opportunities.

And even the most fundamental of human rights and basic human care - for an incontinent person to be kept clean – is a domain of radical innovation.

Innovation almost impossible to imagine, given the reports from the Royal Commissions of the appalling rationing of incontinence garments.

The *2020 Report of the "Global Incontinence Products Industry*" projects that the global market for incontinence care products will reach US$17 billion by 2025, with product innovation driven by RFID and sensor wafer chips.

Sensors will detect when the diaper has been soiled, as well as monitor body temperature, detect abnormalities in urine composition, and even help prevent bed sores by tracking how long it's been since a person has moved.

Smart diapers are yet another adaptation of space innovation. NASA created the Maximum Absorbency Garments (or "space diapers") to support astronauts and provide NASA with essential biometric data of the human performance in extreme conditions.

Could smart diaper data, sensors and data analytics become part of a quality and safeguard framework.

Think about what this would mean for the skills and management of attendant care staff.

And that these sensors can trigger a conversational interaction with a digital human virtual companion: "Mr Jones, the nurse will be here shortly to change your clothes".

A cognitive empathetic engagement of reassurance, so that the person is not left waiting, anxious, wondering if anybody knows or cares.

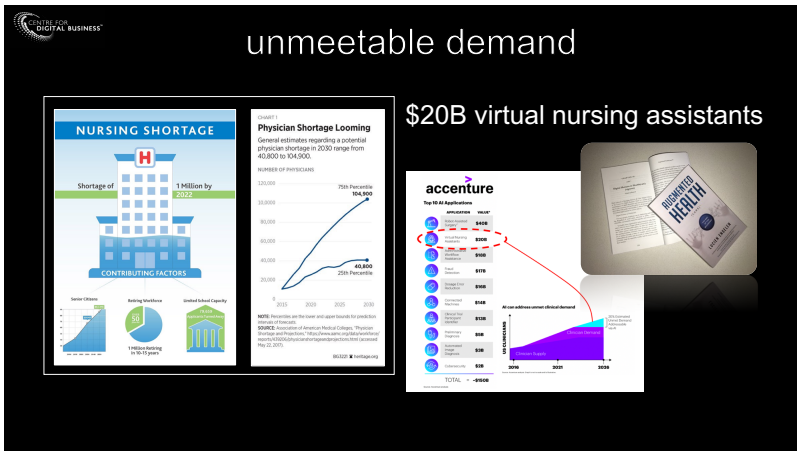
These are conversations I have been having with the home sense group at the *University of South Florida*.

Similarly, there are also phenomenal Australian innovations in smart home technologies, such as the AI powered *Umps Smart Home* product that plugs into appliances used on a daily basis, triggering alerts to carers about changes of routine that could indicated the presence of a health issue.

Co-designed, this innovation requires no batteries; no internet connection; and no special digital literacy.

So accessibility becomes universal and access becomes pervasive.

Unmeetable Demand: Augmented Workforce



And while there is an urgent need for discussion about staff ratios, this discussion is incomplete without a discussion on the rapidly changing nature of work, an augmented services and care

ecosystem of AI, robotics, digital companions, sensing and remote servicing.

Given the pace of change, these exponential technologies provide a new paradigm for rethinking what we mean by unmeetable demand.

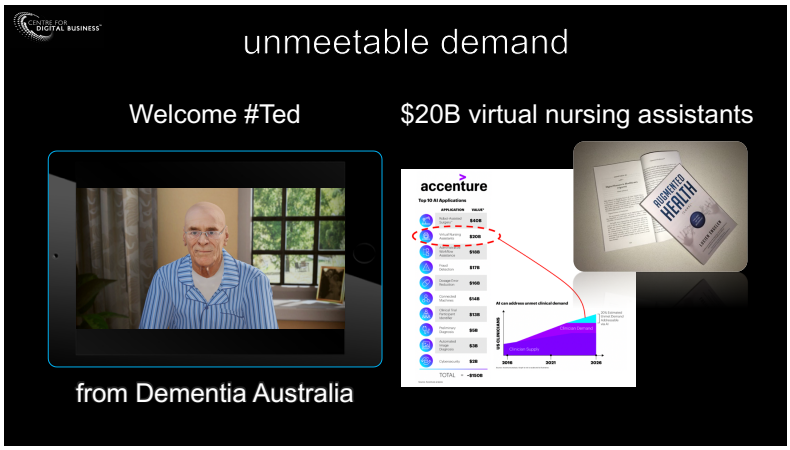
And an equally important humanitarian aspect of unmeetable demand is staff burnout.

A couple of years ago I wrote about this in the chapter “Digital Humans in Health(care)” in Dr Lucien Engelen’s book “Augmented Health(care): the End of the Beginning”.

And there is now significant interest in using this innovation to help on this dimension.

Nadia was designed to be a “trainer” of staff, and for staff to train Nadia. An operating model of capability of an augmented workforce.

Unmeetable Demand: Welcome #Ted



And a very special acknowledgement for the work of Dementia Australia who recently introduced #Ted the avatar.

Co-designed to help professional carers communicate with people living with dementia.

Extreme conditions are yet again the catalyst for breakthrough innovation.

So given the changing mix of presence, scale and exponential reach in terms of time and location, I wonder how the definitions of regional, remote and very remote might need to adapt so as not to unintentionally limit innovation.

Or worse...lose market share.

And whilst the AT market is a massive Australian market – intersecting with the exponential global growth in robotics and gaming technologies and platforms - it does not necessarily follow that the Australian AT market is Australia's for the taking.

Innovation Knows No Borders

But we absolutely should be setting our sights globally.

However, culture and attitude have already cost Australia the global lead in AI digital humans.

Worse, this deprived Australians with disability the opportunity to continue working in this breakthrough area.

Nadia was the world's first AI digital human for service delivery.

But innovation knows no borders and the Nadia innovation has created a global industry.

AI digital human innovations have been deployed by major brands, companies and other governments worldwide.

Nadia has been showcased at Davos and many other global forums.

It has directly led to new companies spinning out; and spawned new realms of commercial and academic research and development.

It is celebrated and recognised globally still as one of the world's most advanced projects in artificial intelligence – and in particular with benefits in humanitarian domains.

Frances West, IBM's first Chief Accessibility Officer, who appeared before the US Senate on the need to pass the UN Convention on the Rights of Persons with Disabilities, spoke about "Nadia" in her book "Authentic Inclusion: Drives Disruptive Innovation."

Dame Hazel Genn, Professor at the University College London (UCL) Centre for Access to Justice, has spoken and written about the Nadia innovation as a model for access to justice supporting disadvantaged groups and people who are illiterate.

The construction of bureaucratic health information and the inability of people to understand it – especially disadvantaged health illiterate people - is one of the biggest causes of medical malpractice litigation in the US.

"Confusopoly" is endemic to healthcare, disability services and access to justice. The solution is resonating in these sectors.

My own continuing advancement of a co-designed AI digital human cardiac coach to overcome the impact of health illiteracy, has started a global movement in digital human health coaches.

I presented this as Faculty at the Exponential Medicine Singularity University.

All that in just 5 years.

And it started from the most disadvantaged, disregarded and discriminated against people in society.

The Nadia breakthrough – born from extreme conditions – changed for all the world the way in which people and systems interact.

Human Rights ~ Ethics ~ Co-Design

So we see that co-design is a capability and field of expertise integral to the operations of complex servicing systems.

Co-design reveals insights not otherwise discernible and catalyses innovation in a way not otherwise possible.

But it is profoundly more than that.

Co-design is essential to understanding how bureaucratic complexity traumatises and stigmatises vulnerable people in the access to justice.

Co-design is essential in the development of policy and process interventions.

In the example of the NDIS Independent Assessment proposal, there is no way that an unknown third party – in a 20 minute interview - could comprehend the magnitude, severity and fragility of my daughter's psychosocial and physical disability. Or any other person's.

And the Australian Association of Psychologists has raised serious concerns.

Of course across a lifetime, *there will be* other policy and process interventions in the future, but this example is used to illustrate the point.

What *is* the ethics and safeguards framework for managing these interventions?

Co-design is more than making things look nice.

Co-design is an essential filter in the evaluation of policy and process proposals to determine the *efficacy* of the proposal *AND* risk to *well-being*.

Such proposed changes must be evaluated within an ethics framework and with the same rigour required to support decisions about the introduction of new medical interventions.

Ethics of Opportunity

And I would like to advocate that we think about ethics differently.

People with disability have described AI as a liberator, and that at last, they had hope for a level playing field. To participate and create in ways not previously possible.

The insights from co-designed AI, smart sensors, and cognitive conversational interfaces will liberate people from laborious, manual, subjective and indiscriminate administrative processes.

If we think about ethics from the perspective of opportunity, that helps how we might seize the benefits of AI for society to better comprehend and push the boundaries of human agency.

So that society is not weakened by a dystopian fear or controlled by ignorance.

Where AI differs from previous technology shifts and accessibility innovations, is that it exponentially changes outcomes and directions in human endeavour.

Every day we ask, explain, analyse, understand and create.

AI's role is to help everyone, regardless of capability, to perform these basic communication and cognitive functions with dignity on an equal basis.

This makes AI a human right.

What we are really talking about is human agency and human agency is understood and realised through co-design.

Ethics would have us make a *choice* shaped by co-design.

What We Take With Us: And What We Leave Behind

In the 2017 Kenneth Jenkins Oration, Andrea Mason, (CEO of NPY Women's Council) reflected on what we need to take with us on our journey - and what to leave behind.

And what moves human endeavour forward – whether the Space Shuttle program or large scale social reform – is what happens when things go wrong.

Following the Challenger disaster, the Space Shuttle program was paused – not stopped – with extensive design review led by the very people who would be on the very next shuttle. The astronauts. The people who had the most at stake.

So we have a *choice*.

To excite society and a young generation with a radically inclusive expansive vision catalysed by human rights, protected by co-design.

Where people with disability *determine what is left behind* and *design what comes next*.

Ignorance is confronted and inclusion in our society is normalised when people with disability – like the astronauts – are the designers – economic drivers and value creators in their own right.

Not just participants in periodic reference groups or the recipients – or "*objects of charity*" - of other people's ideas.

Socially included, wanted, valued and economically rewarded with an exciting future.

There is not a sector that will be left untouched or unchanged by these extreme conditions; the seismic shifts in economic and social activity being brought about by pervasive exponential technologies and rapidly growing markets.

And we know that disability services, aged care and healthcare are at the precipice of this change.

NASA and the NDIS both started as government programs.

But the private sector is now leading the space race. Momentum catapulted by entrepreneurs inspired by science and science fiction, with a bold vision for humanity and a burning desire to change things.

Not waiting. Changing and driving policy.

NDIS belongs to the people.

And uniquely, your organisations are poised to galvanise an unimaginable momentum for Australia.

To boldly re-establish Australia as the global leader and incubator in these massively breakthrough markets of radically inclusive design that will drive *policy* and *new servicing models* for decades to come.

So there is an urgency to act:

To accept and include people with disability as the drivers and designers of radically inclusive innovation.

In closing, I would like to sincerely thank and acknowledge the leadership of the National Disability Services, your organisations, Boards and most importantly – people on the frontline - for your commitment, advocacy and services for people with disability and their families.

"I have been impressed with the urgency of doing.
Knowing is not enough; we must apply.
Being willing is not enough; we must do."
Leonardo da Vinci
