cdaa
Career Development Association of Alberta

CAREER MOMENTUM

February 2022

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Current. Connected. Committed.

CDAA Membership Survey Results

Survey results in full will be available at www.careerdevelopment.ab.ca in the near future.

Thank you very much for the valuable input received from the December / January member survey! The CDAA is a volunteer-run association and receives direction from its members. It depends on an active and involved membership to survive. Through the survey your voices were heard and incorporated in the CDAA 2006-2007 strategic plan. We were very thankful to receive 153 completed on-line surveys.

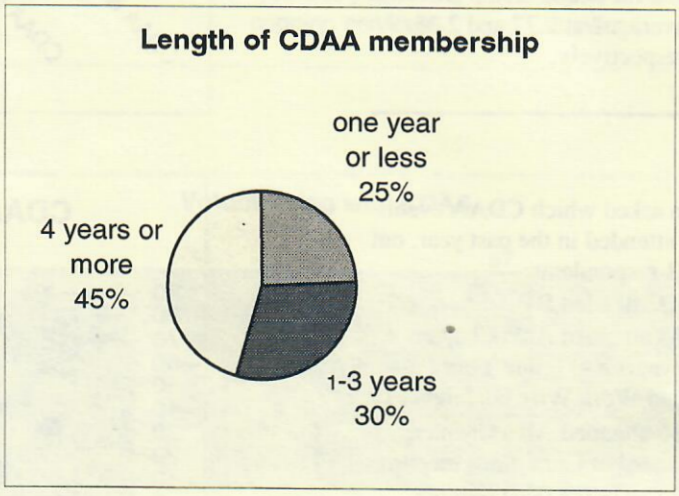
Of the 153 completed surveys:

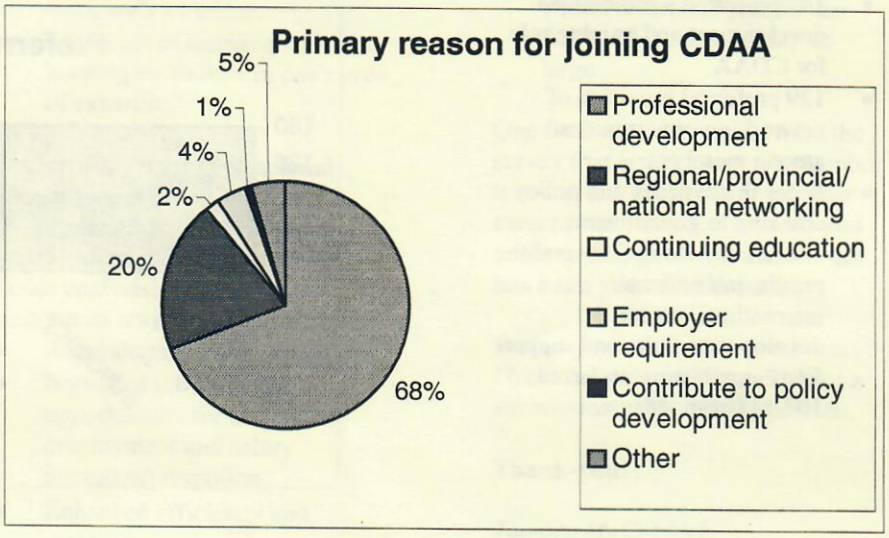
- The largest number of respondents (45%) have been CDAA members for 4 or more years.
- An additional 30% have been members for 1-3 years.
- Of the 25% who have been members less than one year, 10% have been members for 6-12 months (potentially since BTT 2005) and 15% have been members less than 6 months (potentially since September 2005).

- For a large majority of respondents (68%), the primary reason for joining CDAA is professional development.
- Regional/ provincial/ national networking opportunities were ranked first by 20%.
- In comparison, all other options including continuing education, employment requirement, contributing to policy development and other were selected by a combined total of 12% of respondents.

Congratulations!

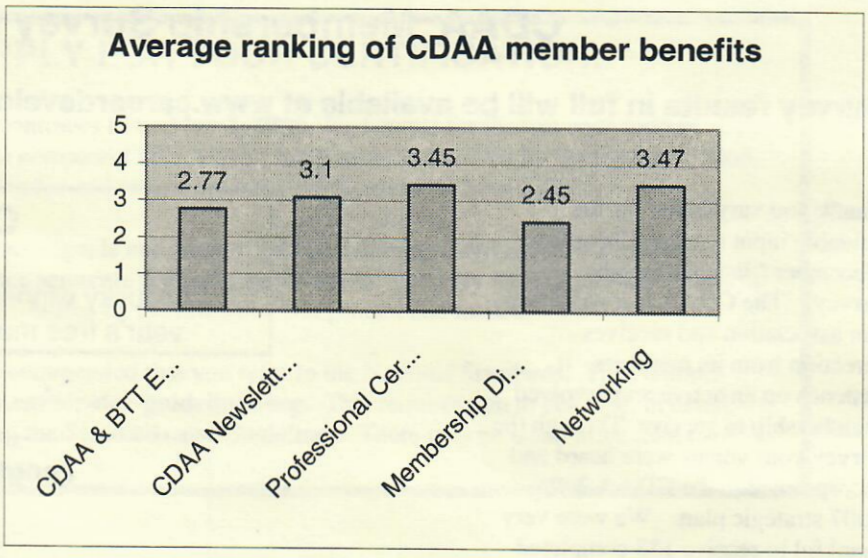
The lucky winner of the survey incentive prize of one year's free membership is Muneerah Dattadeen.





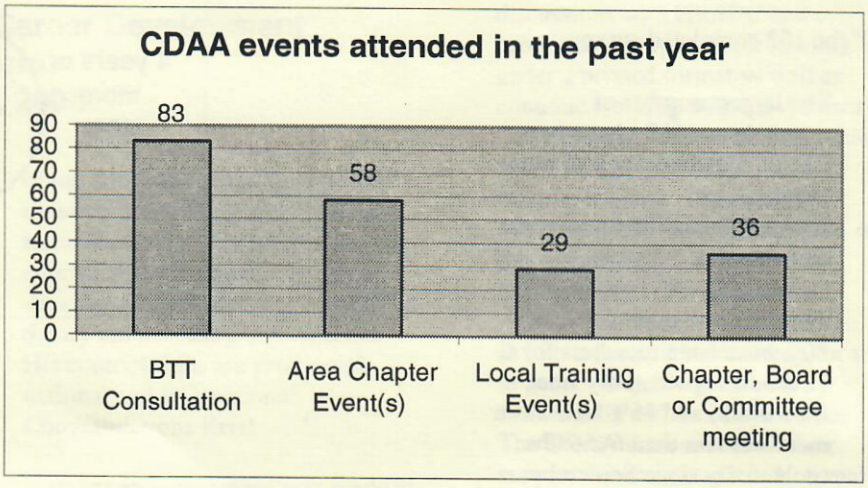
When asked to rank the importance of five categories of CDAA member benefits (out of a maximum score of 5):

- networking and professional certification were most highly rated. (3.47 and 3.45 respectively)
- CDAA newsletters/ publications were ranked next (3.1).
- CDAA & BTT event discounts and the Membership Directory averaged at 2.77 and 2.45 respectively.



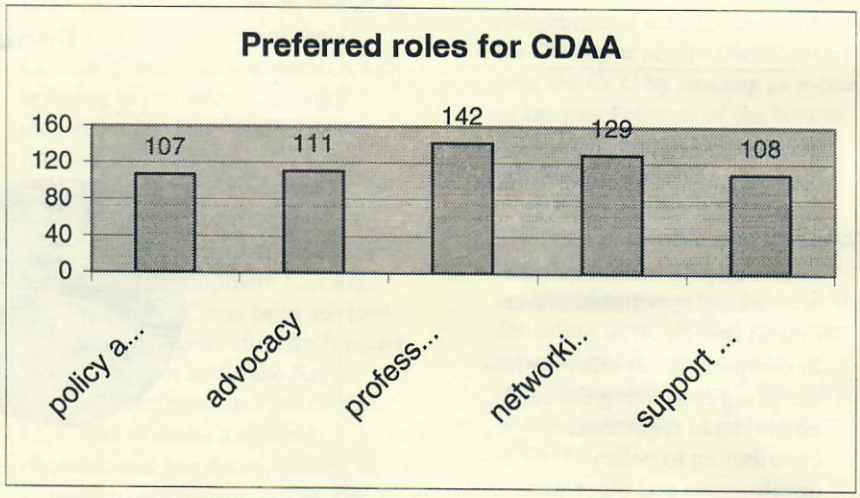
When asked which CDAA events were attended in the past year, out of 121 respondents:

- 83 attended BTT
- 58 attended Area Chapter events e.g. Ignite Your Passion and Work Wise conferences
- 36 attended Area Chapter, Board or Committee meetings
- 29 attended local training events



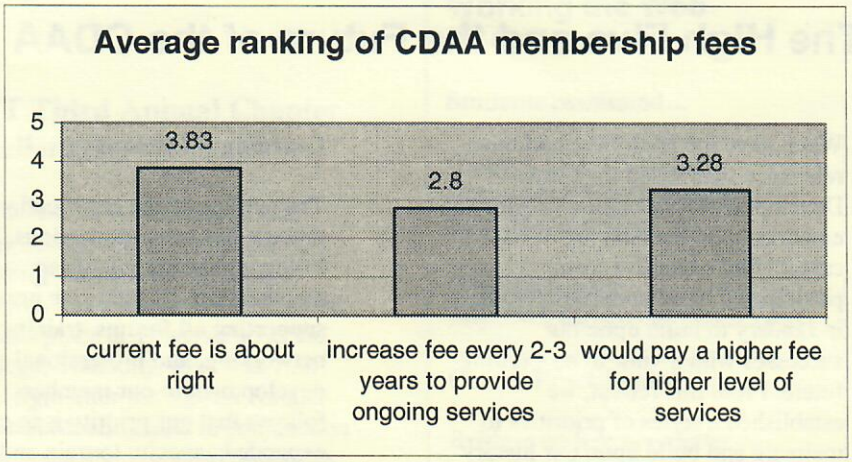
Of 153 respondents:

- 142 preferred a professional development and training role for CDAA
- 129 preferred provision of networking opportunities among members.
- Roles in advocacy and policy advising to governments, educational institutions and the provincial/ national/ international career development field, and support for research were preferred by 107-111 respondents.



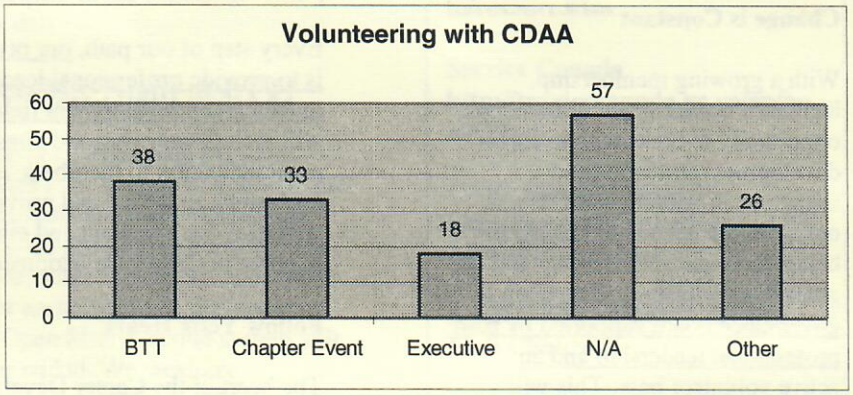
When given alternate scenarios for membership fees:

- The highest ranked preference (out of a maximum score of 5), is to maintain the current fee of $65 per year for services received.
- The next highest choice would have members pay a higher fee to enable CDAA to provide a higher level of services to members.
- Increasing membership fees every 2-3 years to cover increased costs of providing ongoing services to members was least preferred.



Out of 126 responses:

- 57 or 45% do not appear to have volunteered in CDAA activities.
- Active volunteerism is most evident in BTT and Chapter events, (38 and 33 respondents)
- 18 respondents have served on the CDAA Executive.



A main theme from the results and comments throughout the survey was that CDAA members enjoy the current benefits of membership and find professional development as one of the key values of CDAA membership.

What is Professional Development?

- A personally initiated obligation and the right to build discipline expertise, to enhance personal growth, to improve career development skills and to contribute to organizational development.
- Increase of knowledge or skill through study, travel, research, workshops or courses, sabbaticals, internships, apprenticeships, residencies or work with a mentor.
- A process of learning and keeping up-to-date in one's area of expertise.

Design your own Professional Development Plan

When planning your professional development, conduct your own needs analysis! The greatest motivators may be the payoffs:

- A developing sense of mastery
- Improved job skills and opportunities for continued employment and salary increases/promotion
- Enhanced efficiency and creativity on the job
- Shared vocabulary, interests, and relationship with others within the career practitioner field and the community-at-large

One final note – a request from the survey that struck me was a member wanting to hear stories from other career practitioners: **How did you come to this profession and what has been your career path?**

Would you like to share your story? Please let us know! How? Make a submission to Career Momentum.

Thank-you!

Tamara McCormick
Membership Chair

Career Currents

Compiled by Jan Robinson,
CDAA Marketing & Communications Team

TOOLS & RESOURCES:

	Available from CJDC *The Canadian Journal of Career Development* *20th Anniversary Issue* - Robert Shea, Founding Editor | Diana Boyd, Associate Editor A very special issue celebrating 20 years of the CDJC. Founding Editor Robert Shea reflects on the progress of the publication since its first issue in 2002. Articles and research topics include: Barriers to marginalized populations; psychosocial risks in the Canadian workplace; sport-life balance, and more.
	Available at Amazon *The Principle of 18: Getting the Most Out of Every Stage of Your Life* – Eyal N. Danon, January 18, 2022 Discover this groundbreaking approach to structuring your life and career around five consecutive 18-year phases. Maximize your potential with a detailed roadmap for each phase, and become empowered to achieve extraordinary things.
	Available on PRE-ORDER at Amazon – *releasing March 8, '22* *Promotions Are SO Yesterday,* Julie Winkle Giulioni "Careers have changed. It's time for Career Development to catch up." Discover seven ways employees want to grow, beyond promotions, positions and moves. How to help workers thrive when promotions are not readily available, using a simple framework of seven alternative dimensions of development (contribution, competence, confidence, connection, challenge, contentment, and choice). Pre-order and receive an **exclusive bonus chapter**, *Multidimensional Career Development: Your Coaching Role* directly from the author at juliewinklegiulioni.com

INTERESTING ARTICLES

These are the most in-demand and highest paying jobs in Canada for 2022 – dailyhive.com

It's no secret that because of the pandemic, and a volatile economy, the job market is changing. Randstad's look at three key areas reveals the most in-demand skills, the top 10 remote roles and the highest paying roles for 2022.

The jobseekers boosting their applications with video CVs – bbc.com

Everything about today's job search seems to be changing, except the resume. With much hiring done by virtual interviews, an increasing number of candidates are jumping in front of the camera to boost their odds of winning a job. Should your clients do the same?

Are microcredentials the future of higher ed? – universityaffairs.ca

A growing trend to short courses that cultivate and verify a particular skill, or competency that employers want in order to meet rapidly changing labour market demands ,has been accelerated by the pandemic.

RECOMMENDED ONLINE OPPORTUNITIES

Labour Market Information: New LMI for Career Practitioners in Canada – eventbrite.ca, sponsored by the Labour Market Information Council (LMIC), presented by CERIC

A free, 3-part webinar series (Feb. 28, Mar. 28, Apr. 5, 2022) examining emerging labour market information in Canada, offering research and analysis to support career practitioners in their work.

Monday Meet-ups – Chartered Professional Accountants of Alberta

Career Development Events & Workshops offered online by CPA Alberta's Career Services. Ongoing, free webinars on a wide variety of career topics held every Monday from 12:00-1:00 pm. Registration is required.

RESEARCH THIS QUARTER

Businesses face shortage of skilled workers and young employees: report – Canadian Press

A poll conducted by Environics Research Group in November and December 2021 found that 75 per cent of Canadian executives say their biggest challenge is a shortage of skilled workers, up from 68 per cent in 2013, but only 27 per cent of these employers have skills training programs in place.

New research on the stereotypes formed at a young age, their long-term impacts and what can be done to tackle them successfully – hepi.ac.uk

New research from the UK shows that once established at a young age this mindset is difficult to change later and influences the subjects they study and the career paths they take as adults; as well, a University of Houston study findings show that children from the age of six often rule out options based on ingrained stereotypical views they have about the jobs people do.

Alis Update (alis.alberta.ca)

Free alis bookmarks, postcards, and posters

The free outreach materials on alis have been restocked. If you're currently providing in-person career, learning, and employment supports to your clients, or if you plan to again soon, now's an excellent time to order some alis bookmarks, postcards, and posters to help inspire and motivate Albertans on their career journey.

There are 4 main designs:

1. **[Green] Imagining your future?**—Directs clients to the Plan Your Career section.
2. **[Orange] Want the work skills of tomorrow?**—Directs clients to the Explore Education and Training section.
3. **[Pink] Ready for your next job?**—Directs clients to the Look for Work section.
4. **[Yellow] How many careers will you have?**—Directs clients to the labour market information on OCCinfo.

All outreach materials ship completely free, anywhere in Alberta. You can place your orders here.

Also, don't forget to check out the Inspire and Motivate section on alis, which is designed to support career development professionals such as yourself. And remember to check out What's New on Alis regularly for new and updated content.

If you have questions, feedback, or ideas regarding alis and how you can better integrate it into your work, let us know by contacting the team directly:

- Email—alis.info@gov.ab.ca
- Phone—780-422-1794 (for toll-free access in Alberta, first dial 310-0000)
- Online—through our feedback form

The Way Forward: Career Opportunities of the Future Cannexus 2022

By Ann Nakaska

Frank Parsons (1909) the grandfather of career development, said we need to know ourselves, know industry and create a match between the two, which led to the development of trait and factor theory.

However, Parsons' words have been greatly simplified. What he actually said was:

> *In the wise choice of a vocation there are three broad factors:*
>
> 1. *A clear understanding of yourself, your aptitudes, abilities, interests, ambitions, resources, limitations, and their causes*
> 2. *A knowledge of the requirements and conditions of success, advantages and disadvantages, compensation, opportunities, and prospects in different lines of work*
> 3. *True reasoning on the relations of these two groups of facts.*

As career practitioners, we do a very good job of helping our clients know themselves. We need to ask if we do a good job of helping our clients understand industry. I believe we need to be the bridge to industry for our clients. It is because I believe that knowing industry is so fundamental in making good (and even better, great) career decisions that I speak on the topic of future career opportunities.

As well, we need to help our clients with their true reasoning or critical-thinking skills, so they have the ability to examine how the knowledge of these two groups relate to each other and to see the possibilities in an everchanging workplace.

My Why

My reasons for sharing information about industry and the fourth industrial revolution are grounded in Parsons' work. Just as organizations must understand the markets and their industry, so must our clients. Industry knowledge is so much more than labor market information. My goal is to:

- inspire you about the future and the career opportunities that await our clients
- go beyond the numbers and statistics of labor market information and entice you with industry information that will leave you excited about the future
- introduce you to the world of work, the fourth industrial revolution, and the global economy so that clients can see that work opportunities extend well beyond their backyards
- explore global work trends so that we will be aware of whether we are keeping up or falling behind in the world of work

This research of work from around the world and sharing of industry information are my gift to you, to give to your clients to inform them, educate them and inspire them. Let's begin our journey.

For the purposes of this presentation, I will be doing a brief review of the fourth industrial revolution. I have previously discussed this information in another article (Nakaska, 2020) and will be focusing on four major industry areas for this article:

1. health care
2. aerospace and aviation
3. agriculture and horticulture
4. energy and environment

In exploring career opportunities in each of these areas, I will discuss careers that are in demand and will provide information on how the fourth industrial revolution is impacting these industries. I will also briefly touch on a variety of job opportunities that clients from all demographics can explore, including those with few skills and lower levels of education.

The Fourth Industrial Revolution

The fourth industrial revolution is a combination of the physical, digital, and biological worlds. When we combine these worlds, we develop work in the following areas:

- digital, which includes artificial intelligence, the internet of things, big data, blockchain, cloud computing, augmented reality, and virtual reality
- physical, which includes robotics, 3D printing and autonomous vehicles
- biological, which includes neurotechnology, genetics, bioprinting and synthetic biology

When we look at the three worlds of the fourth industrial revolution, we can see that for all industries we will need:

- information security analysts
- computer user support specialists
- systems software analysts
- computer systems analysts
- application software developers
- computer and info systems managers
- all other computer specialists

While these technical jobs often make the list of 20 top jobs of the future there are also non-technological jobs for our clients. We will need a wide array of skills as we move forward.

Health Care

The health care field will continue to boom in the future. "You don't want a robot taking care of your baby; an ailing elder needs to be loved, to be listened to, fed, and sung to. This is one job category that people are—and will continue to be—best at." It may be surprising that this statement was made by Oren Etzioni (2017) the CEO of the Allen Institute for Artificial Intelligence, discussing which jobs people should consider when their existing jobs are automated. What he says is true. People are not really open to the idea of robots taking care of the people they love. The COVID-19 pandemic has further highlighted that we need to do much better at taking care of our loved ones.

A Business Insider article (Kiersz and Hoff, 2020) lists many of the careers that will be in demand in the health sciences field:

- nurse practitioners
- physical therapists
- medical and health managers
- physician assistants
- practical and vocational nurses
- post -secondary health specialties teachers
- registered nurses
- all other physicians and surgeons

The US Bureau of Labor Statistics' Occupational Outlook Handbook (2020) states that careers in the health care industry will grow by 15% overall from 2019 to 2029, making it the fastest growing industry. It is predicted that the US will be adding 2.4 million jobs during this decade in this field.

The COVID-19 pandemic has emphasized how important the health care industry is, and that there are many related health care businesses, such as medical equipment and services, that will also need people. It has also shone a light on health care issues that will need to be addressed in the coming years, such as hospital capacities and senior care facility effectiveness.

We know that the baby boomer demographic will require more care as they age, and it only stands to reason that we will need more home health aides and more personal care aides. This trend is impacting other countries, not just Canada. In the US, according to O*Net (like our NOC site) home health aides and personal care aides will see an increase of 34% within the next decade with an estimated increase of 1,159,000 positions. We will also see an increase in the number of human services positions in supportive care:

- massage therapists with an increase of 21% and 34,400 new positions
- recreational therapists with an increase of 8% and 1,700 new positions
- recreation workers with an increase of 10% and 34,400 new positions

I include these statistics so that we can get an idea of what the demand may be worldwide for people working in this area. Our clients may be wanting to work in careers that are easily transferable from one country to the next as we move towards a work-from-anywhere model. Healthcare will provide many international opportunities.

Looking at different ways to work in the future, consider the franchise opportunities that I have discovered in Top Franchise. I include these because sometimes people are interested in starting their own business but need the help and support of a structured business platform. For those who want to be part of the growing number of elder care businesses that help seniors to stay in their homes longer, clients can look to a franchise as one way to meet this growing need. Some examples are:

- Living Assistance Services
- Comfort Keepers
- Qualicare
- For Seniors Only
- Senior Home Care by Angels
- Right at Home
- Nurse Next Door

As well, Silver Cross is a franchise opportunity that sells, installs, and maintains accessibility and mobility equipment for residential applications.

As practitioners, we also need to explore positions in the emerging caregiving fields that are not accounted for in the Occupational Outlook Handbook (2020). One of these areas is geriatric care management. It is not a healthcare position as such. It is an advocate position for when the elderly can no longer care for themselves and their families need answers to many complex issues, including health, legal, and housing for their elderly family members.

We also need to help clients with lower levels of education who may be finding work difficult. For example, we will still need orderlies in hospitals, a job that requires little or no education. As well, the elderly, who often want to maintain their independence, will need people to help them with personal care and home maintenance. Because they are often homebound, there is opportunity for people to bring more and more services to seniors. Some examples are hairdressers/barbers including bringing services directly to seniors' homes, massage therapists, walk-and-talk partners so seniors can get out without worrying about falling, elder-sitting for spouses of in-home dementia patients, downsizing and moving operations, lawn and sidewalk care, home maintenance, translators for doctors' appointments, people to accompany the elderly on medical procedures, and medical equipment rentals.

We need to help clients think outside the box and encourage them to develop entrepreneurial skills and financial literacy, so they can create their own businesses and earn a living wage.

Drones in Health Care

In an article for DoctorPreneur, Dragolea (n.d.) discusses nine drones revolutionizing the healthcare industry:

- Seattle's Village Reach and Matter Net, a Silicone Valley company, and Vayu Drones are in the business of transporting blood and stool samples.
- Zipline transports blood for blood transfusions.
- Flirtey, Google Drones, and Alphabet's Project Wing are using drones to deliver food, water, and emergency medical supplies to people in need of assistance, helping in rescue operations and post hurricane recovery.
- Companies like Tu Delft have integrated cardiac defibrillators and 2-way radios and videos into the actual drone to provide emergency help for bystanders to assist in cardiac emergencies until medical services arrive on scene.
- EHang have created a drone capable of transporting a human being, for quick organ donation and distribution of organs in emergency situations.

Certainly, drones will be used in each of the three areas touched on in the Dragolea article: aiding search and rescue operations, medical care, and transportation and delivery. An article by Tucker (n.d.) also adds the delivery of:

- blood supplies between hospitals cutting down delivery time
- medication to patients within the hospital setting
- vaccines and antivenom

Also, homecare workers doing on-site visits can draw blood samples at a person's home and ship the samples via drone to the laboratory for testing. Drones can also be used to deliver meals and medications to geriatric patients who are homebound. Drones will be used more and more to assist the medical and emergency services field. For those clients interested in health care but who do not want to be a doctor or nurse, work in the drone industry may be a good fit.

Virtual Reality

Virtual reality (VR) is a technology that allows us to live in another world while at the same time existing in our own. For example, GoogleVR (2020) allows us to travel virtually through the Grand Canyon without ever leaving our chair. More and more VR is being used in elder care because VR is a very inexpensive way to give seniors in long-term care facilities experiences they can no longer have in the real world.

Here are a few examples of how VR is being used in geriatric care that I have discussed in a previous article (Nakaska, 2021):

Both Fischer (2019) and Rogers (2019) discuss the major benefits of using VR, mainly decreasing the isolation that many people feel within long-term care facilities. For example, MyndVR and senior facilities allow groups of residents to "attend" an event, such as a virtual Frank Sinatra concert. Participants feel like they are experiencing events they may never have had the opportunity to go to before. These experiences can allow whole groups of seniors to have a shared experience, thus giving the group something to talk about with each other.

Studies have also found that even patients with extreme dementia experience increased positive mood, more social interaction, and improved memory with the use of VR. Work by such researchers as Dr. Ang from the University of Kent demonstrated that patients with extreme dementia would later recall landscape themes after viewing 15-minute segments of natural beauty, such as forests, seascapes, or mountain scenes.

Another benefit of using VR with seniors is that many residents are able to experience items on their bucket lists, "travelling to the see" the Eiffel tower or London's Tower Bridge. More importantly though, it increases their desire to socially interact with their care providers and share these remembered experiences with other people.

Viarama, MyndVR, Rendever, VR Genie and Virtual Exercise are five of the companies doing work in VR and elder care. Virtual Exercise is being used in conjunction with stationery gymnasium equipment, allowing residents the ability to hike up mountains or bike in a forest.

Bioprinting

Bioprinting is used to create tissue, cartilage, and even organs (Nakaska, 2020). But bioprinting is being used for so much more in the health care industry. Pharmaceutical Technology newsletter (Global Thematic Research, 2020) outlined some of these trends:

- to manufacture precision and personalized pharmaceuticals, such as the Aprecia Pharmaceuticals drug Spritam for epilepsy, the first and only FDA approved 3D printed drug
- in personalized 3D printing of pharmaceuticals, allowing for inhouse printing of patient doses based on body size, age, sex, and unique lifestyle characteristics
- bioprinting human tissues and organs for research and development with new drugs, vaccines, and cosmetics, removing the need for animal testing and providing better results
- Bioprinting organs for pre-operative planning in complex surgeries, allowing medical staff to practice on bioprinted organs before operating on the actual patient

Closely related to bioprinting is 3D printing. Also discussed in the same article, two areas that 3D printing can be used to help the medical field are:

- with the aging population by creating orthopedic implants
- companies such as 3D Systems, Carbon and Renishaw designing and manufacturing open-source PPE for healthcare workers worldwide

While it may seem like we covered a lot of ground in the health care industry, we have only examined a very small sampling of what is happening in this growing field. For example, we haven't even touched on big data or artificial intelligence (AI) in health care. I encourage you and your clients to take the time to explore more opportunities in this amazing field.

Aerospace and Aviation

Space is the new frontier. So much is happening in this industry and it's one of my favourites to report on. For most people though, aerospace is a science fiction industry that they really can't relate to. However, I would like to ask you how you think a freefall jump to Earth, the Movie The Martian, and my book club might be connected, to demonstrate just how close the aerospace industry is to us.

Loreen is a member of my book club and her son, Shane, grew up in our community. He went to school here and played soccer here. Shane went on to study at MIT in the US. He worked on a space suit that was later used in one of several record-breaking freefalls to Earth. He is currently working on designing space suits for Mars. While we tuck our kids and grandkids in at night with stories about dinosaurs and kittens, Shane tells his two little girls how one day they will go to Mars.

That's how close the aerospace industry is, as close as my book club. That's it.

If you are one of the many who believe that aerospace is just a playground for the very rich, I would like to gently challenge your thoughts on this industry. I need you to know that I am super excited to share information about one of the fastest growing and important industries that is developing right before our eyes, and it is going to be huge. Morgan Stanley predicts the aerospace industry will be 1.1 trillion-dollar industry by 2040 (Archer, 2017).

If you are familiar with my research in this area, you will know that I cover a wide range of topics in the aerospace industry. While I have discussed satellites, space tourism, and space mining in the past, in this presentation, I will focus on the Moon and Mars development and then add in some of the other interesting work going on in the field.

The Moon and Mars Development

We are going to the moon. We are going to the moon in a big way. As I have reported earlier, we will have a moon base on site by the end of the decade. I have to say I am super excited about doing an update on this project because it's moving forward much faster than even I was aware.

The Artemis Project is about setting up a base on the moon (NASA Artemis, 2022). It is a joint project between NASA and several private space companies. This project is made up of several parts:

- Orion Spacecraft
- Space Launch System Rocket
- Exploration Ground Systems
- Gateway
- Human Landing System
- Artemis Base Camp

Artemis 1 will begin with an Orion spacecraft being launched using the Space Launch System rocket—picture a smaller rocket being carried by a larger rocket system—as early as February 2022. This will be the start of getting space craft to the moon again.

This Orion spacecraft, an unmanned flight, will first orbit Earth. Then it will head to the moon and circle the moon. Then it will head out into deep space, return, and circle the moon again, after which it will head back and land on Earth. The second flight will run the exact same path but will be a manned flight.

If all goes well, then the next stages of the project which will involve expanding NASA's Cape Canaveral launch site from a government-only launch site to a spaceport. It will then launch both commercial and government rockets, thus expanding and broadening its use for more aerospace development.

Next, NASA and Northrop Grumman have finalized a contract to develop the Habitation and Logistics Outpost for Gateway, a critical way station and outpost in orbit around the moon. Gateway will act as a connecting point for spacecraft to dock and allow astronauts to disembark. They will then head to the moon or on to deep space missions.

This spaceship will be in lunar orbit for more than a decade, providing people a place to live and work and supporting long-term science and human exploration on and around the moon. Gateway will be the place where astronauts will transfer between Orion and the lander on regular Artemis missions.

The Human Landing system (the lander) will take people between Gateway and the moon.

Lastly, on the moon, Artemis Base Camp will allow up to four astronauts to live and carry out research on the moon. The camp will comprise a lunar cabin, a rover, and a mobile home where astronauts will see if they can live away from camp and from Gateway for extended periods of time of up to 45 days. NASA is aiming to have people back on the moon by 2024—that's right, 2024—at their base at the lunar south pole. What NASA and their partners learn on the moon they will use to establish deep space colonies on Mars.

Who are some of NASA's other partners?

NASA has named three companies it will work with to replace the aging International Space Station: Blue Origin, Northrup Grumman and Nanoracks (the company that developed Starlab, an independent space lab that can house up to 4 crew members—think mini-International Space Station). Each company will develop their own space station. (NASA government, 2022).

But NASA and the US, along with their international partners, are not the only ones who are trying to make a name for themselves in space. Many countries are involved in the aerospace industry.

The UK's Spaceport Cornwall (2022) is expecting to be up and running this year and will enable a converted Boeing 737 to do small, sustainable space launches from an extended traditional aviation runway. If this is successful, it will be a model that other countries may be able to easily replicate. Spaceport Cornwall's goal is to make space more accessible to more people. Spaceport Cornwall's location was selected because it is already a hub of 66 aerospace companies. It is part of a strategy to further develop start up aerospace companies. With the work being done here, the UK is hoping to capture 10% of the aerospace industry.

The Goonhilly Earth Station, part of Spaceport Cornwall (2022) a facility covered with super-large satellite dishes, on its own provides work in the following areas (citation):

- ground stations, including satellite services
- deep space, focusing on deep space communication
- supercomputing and space AI
- advanced manufacturing
- consultancy, training, and education
- Space AI Institute and cloud services

Other countries involved in aerospace include Canada's own Spaceport Nova Scotia which should have started construction and be well underway beginning this year, (2022) It is operated by Maritime Launch and will provide launch services for other companies' satellites into lower Earth orbit.

Israel's Space Pharma is a company that can plan, develop, and execute experiments in microgravity in their unmanned, miniaturized, remotely controlled fully automated minilabs (2020). Because bacteria and micro-organisms multiply faster in space, pharmaceuticals and the research process can be sped up. They provide this pharmaceutical research for companies all over the world.

Colorado School of Mines has been offering undergraduate, masters and PhD programs in the field of space mining since the early 2000s and in August of last year, students from the school won second place in NASA's Break the Ice Challenge (2022).

Also, MarsFarm (2022) provides classroom greenhouses and allow students to participate in the "Growing Beyond Earth" project. This is a classroom-based science research project, conducted by Fairchild Tropical Botanic Garden and NASA. What I like about this program is that it is teaching children how to grow food in space and will hopefully inspire a new generation to work in the aerospace industry.

There is so much being done in this sector, and in this session, we haven't even touch on space tourism, space manufacturing, satellites and communication, or waste management in space. More and more companies are becoming involved in this exciting new industry, and the next few years will demonstrate just how much this industry is going to grow.

An added benefit of the aerospace industry is that it will help the aviation sector grow in general, with advanced technologies for faster and more efficient airplane travel. As we move out of the COVID-19 pandemic, as current pilots retire, and the industry grows, we will need more pilots. The great aspect of this role is that while it's nice to have an aviation diploma, clients can also work their way up through the ranks from ramp to pilot in command. Let's not forget too, that aviation companies will also need aircraft mechanics, dispatchers, customer service personnel, administrators, and managers.

Agriculture and Horticulture

Let's come back to Earth now and focus on one of the very first industries: agriculture.

I married into a farming family. My husband grew up on a farm in rural Alberta. Many members of his family are still farming near or on the homestead land. His uncle who farms in that area, just turned 88. Up until a few years ago, he was doing contract work for one of the farm equipment companies in the area. He would do grain farming during the warmer months, then put together swathers in his Quonset during the winter. He was paid a piece rate, getting paid for the number of swathers he either wanted to or was able to complete.

I share this story for several reasons:

- to demonstrate that people, especially those over 50, can work and earn extra income well into their senior years
- to highlight the fact that not all gig work is about driving an Uber; contract work can develop from the work people have been doing all their lives
- to show that people, especially those over 50, can have flexibility in how much or how little they work
- to think about work in other industries that may not be top of mind (For example, it would be easy to steer people who are mechanically inclined into auto mechanics or heavy-duty equipment mechanics. We need to realize there are programs that specialize in farm equipment repair and that agriculture can use these skills. Programs such as the Olds College Agricultural and Heavy equipment technician program are one example.)

- to get career practitioners and clients to think about outside-the-box opportunities that exist in the agricultural industry and other industries

What is happening in the world of agriculture and horticulture? Lots. Our population is continuing to grow, and we will need to continually increase food production. Also, as we become more and more environmentally aware, we will need to become more responsible for the greening of our planet. With these two trends in mind, we will explore the area of food factories and bioprinting food in agriculture. Then we will explore biophilic cities and architecture. Lastly, we will touch on other in demand careers in the agriculture sector.

Bioprinting Food

Recently GoodLeaf Farms (2022) a company based out of Ontario announced that they would be building a vertical farm in southeast Calgary with funding from the Alberta Government. It will create up to 70 skilled and unskilled jobs in the area, with opportunity for expansion. Vertical farms are farms growing inside three-to-four story buildings, often warehouse retrofits. They have the advantage of reducing food transportation costs because all food is grown locally, they extend the growing season to year-round, and they reduce fertilizer problems and use far less water than traditional farming models, making them attract farming business models. Vertical farms are not new, but they are becoming more and more prevalent. This farm will be Goodleaf's largest indoor farm constructed to date.

Another method of food production for the growing Earth population is the use of bioprinting to manufacture food, not something I necessarily find appetizing, but it is interesting, nonetheless.

In past presentations, I have shared that the Japanese company Mirai (2020) is in the business of printing meat for human consumption. I wanted to see who else is now working in this area and how much this area of the industry has developed over the last couple of years. It turns out many more companies are moving into this food production space.

Upside Foods (2022) formerly Memphis Meats, funded by the likes of Bill Gates and Richard Branson, are developing chicken for food outlets and restaurants. I took a quick peek at their career page to see what jobs were listed:

- Sr. Flavor Scientist
- Media Manufacturing Technician (Cell Culture Media)
- BioProcess Associate
- Research Associate II, Process Development
- Scientist/Engineer, Process Development
- Sr. Mechanical Engineer
- Sr. Research Associate, Process Development
- Sr. Scientist/Engineer MSAT

Our clients may be interested to know that these positions required a bachelor, masters or PhD degree in chemistry, biochemistry, bioengineering, or closely related sciences.

Other non- science related jobs that were posted:

- Systems Administrator - IT
- Commercial Counsel - Legal
- Executive Assistant - Administrative

I feel it is important to demonstrate that although the fourth industrial revolution is having an impact on the number of science and STEM career type jobs, there will still be a need for sales and marketing people, human resources, and business development people in a wide variety of industries.

Other news in the use of bioprinting for food production:

- In July of 2020, the 3D Media Report Network posted an online article about a research team from the University of Gothenburg in Sweden and the Technical University of Denmark that is using 3D printing to create a plant-based seafood, in this case a salmon filet. Their new brand is called Legendary Vish (Boissoneault, 2020).
- BeeHex (2022) is a bioprinting food company working with NASA to bioprint food in space. Using a combination of AI, robotics, bioprinting and machine learning, they also provide customized baking solutions for large bakeries. They can also create personalized nutrition bars for their customers.
- Shannon Theobald (n.d.) is a blogger and has a book on printing your dinner, personalizing in the future of food. Her blog entitled 10 Must Knows in the Future of Food: Bioprinting discusses the concept of nutrigenomics, the science of combining nutrition with genetics, which results in the ability to prevent disease by printing food completely tailored to your health risks.

Biophilic Cities and Architecture

As we look to battle climate change by greening our planet, especially in urban areas, we see a trend towards biophilic cities and architecture. Biophilic meaning life-loving. The concept of biophilic architecture was developed by Stephen Kellert who is well known in the field.

Singapore is a great example of a biophilic city (n.d.). It includes canopy walks, elevated parks, green areas, and elevated walkways. However, if you have a chance to visit the Jewel Changi Airport in Singapore, you will also see a wonderful example of biophilic architecture. Here you will witness the rain vortex, a huge waterfall in the connecting area of three of the airport's terminals. The airport contains gardens and over 3,000 species of plants (Baby, n.d.). No surprise that it is an award-winning airport.

The Amazon Spheres building in Seattle, WA, is another great example of biophilic architecture. It contains green walls and is divided into three main areas. It contains over 40,000 plants from over 50 countries (2022). To support this building design, Amazon hired a horticulturist to oversee the project and to work at the greenhouse in Redmond, WA.

They are now starting construction of their second biophilic-designed headquarters in Arlington, VA (Harrouk, 2021). HQ2's, The Helix, is an awe-inspiring building that will run on 100% renewable energy and will achieve one of the highest awards for sustainable architecture.

The One River North project in Denver, CO has hiking trails intertwined throughout ten of its 16 stories, incorporating the nature of the state into the building (2021).

As we move to create and develop more biophilic cities and buildings, we will need more people with a horticultural background. We will also need people to grow plants and maintain the many green walls that will become part of our future.

Other careers I have touched on in previous articles (Schwarck, 2021) that will be in demand in the agriculture sector are:

- agricultural lawyer
- agricultural economists
- bio-informational scientists
- animal geneticists
- agricultural operations managers

And while the demand for fruit and vegetable pickers is lessening, we will still need many of these seasonal workers, providing some work for lesser skilled workers or for those wanting only short-term work opportunities.

Energy and the Environment

What we need to know right from the start is that the fourth industrial revolution will require an incredible amount of energy.

To give you an idea of just how much power and energy we need to run this revolution, we can look at one tiny piece: Bitcoin. The cryptocurrency company uses more energy than each of the Netherlands, Argentina, and the UAE (Criddle, 2021). That is correct: Bitcoin, and Bitcoin alone, uses the same amount of energy as an entire country. In fact, if Bitcoin were a country, it would be in the top 30 countries for energy consumption.

Before we really get into discussing these two industries, I would like to share that our fifth grandchild is on the way this summer. It's important for me to share this side of my life because I need you to know that I have five very important reasons to care about the environment and climate change. For me, it's about having an "and" focus: industry AND the environment. These two sectors need to work together, not against each other. We can't be so focused on the environment that we shut down industry, because this is not good for the economy and people's jobs. Just as important, we also need industry to step up and care more about their impact on the environment. This is the perspective that I bring to these two business sectors: that the focus is on working together to solve problems and on solving the right problems.

Energy is going to be a very important part of the future, which means we need to understand:

- what the demand for energy is going to be
- how we are going to supply this growing demand

It also means we need to address the environmental and financial concerns of each energy source throughout its entire lifecycle to determine best practices, including:

- resource consumption, addressing the environmental impact of mining all the raw resources we need for each energy source
- resources for structural construction, addressing all the resources we need to construct each energy source, such as hydroelectric plants, nuclear power plants, wind farms, solar farms, and NGL plants
- contribution to the power grid, examining whether using this energy source will provide a consistent or inconsistent energy source, and what energy source will be used when inconsistent energy sources are not producing power
- the lifecycle of the energy source, examining how long each energy source will last and how often we will need to replace it
- recycling of materials at the end of the lifecycle, including the examination of whether the energy source will contribute to global waste when it is decommissioned
- increased costs to the end user, the consumer, which will hurt marginalized clients the most if they are not able to afford to heat their homes, have electricity for computers and vehicles, and to pay for the increased cost of living as businesses add in higher energy costs to goods and services

Why is addressing these issues important? The Elon Musk has stated that we will need to double the current capacity of our power grid to power all the electric vehicles that will be coming online (Posky, 2020). I have also heard that this number may be low, and that we may need to triple or quadruple the amount of energy supplied by the current grid. Remember that our current grid supplies only the power we need now, not future demands on the grid. It means doubling the collective output of all our current hydroelectric plants,

nuclear power plants, solar farms, wind farms, NGL plants, and coal plants, and the capacity of our power lines to handle this new demand. This requires a lot of resources to power our growing electricity demands, and this needs to be added to the total energy equation.

It also means that we will need power engineers and technicians, electrical engineers, lines people, and many others to bring this all to fruition. What else is happening in the energy industry? Here is some of the news and trends on the energy front.

The East Fusion Facility in Heifei, China has created a plasma gas that can be heated to five times hotter than the sun, as well as keeping it there for 101 seconds before it dissipated, a new record both for heat and duration. The race to create thermonuclear fusion energy is closer and closer. If they succeed, it will be a game changer in the energy sector (Turner, 2022).

Others working in this area are the US at MIT, and the UK's Commonwealth Fusion Systems and Tokamak Energy. South Korea also has a fusion facility.

Some of the largest solar farm projects in the world are Tennger Solar Park in China, Bhadla Solar Park and the Kamuthi Solar Park in India, Villaneuva Solar Park in Mexico, and Solar Star Solar Park in California (Hodgkins, 2018). If you get a chance, check out the Mohammed bin Rashid Al Maktoum Solar Park, planned to be the world's largest solar park in the United Arab Emirates, which will contain not only solar panels but also a giant solar tower (2022). The project is in its final phases and should be completed soon.

Some of the largest wind farms in the world are the Gansu Wind Farm in China, Jaisalmer Wind Park and the Muppandal Wind Farm in India, Alta Wind Energy Center in California, and other wind farms in Oregon and Texas (Pradhan, 2021).

Bloom Energy Corporation is a company specializing in hydrogen fuel cell products and microgrids that act independently from the larger power grid in times of power outages. They have 100 microgrids distributed around the world (2022). They are partnering with MSC cruise lines to operate cruise ships with green energy technology. They are supplying hydrogen fuel cell power to South Korea, and their technology was used by NASA for energy generation on Mars.

Canada has four provinces (Ontario, New Brunswick, Saskatchewan, and Alberta) signing on to the small modular reactor (SMR) Memorandum of Understanding, taking the first steps towards developing SMRs in their respective provinces (von Scheel, 2021). SMRs produce more power than solar and wind and take up less land, making them a better option as a consistent energy source.

These projects demonstrate the variety of energy industry opportunities happening around the world. As our demand for power continues to increase with the fourth industrial revolution, we need to explore other options for clean power generation. We also need to start focusing on which energy sources make the most sense for the situation and the geographic location. Should we be covering farmland versus buildings and parking lots with solar farms? Does it make sense to use solar in northern regions where solar farms become less effective? Demanding areas use hydroelectric when their geography makes it impossible to create this energy source also makes no sense. While it may make sense to use small electric vehicles, it may be more advantageous to use hydrogen fuel cells for larger vehicles.

Lastly, I am also going to suggest we examine other options to these alternative energy sources based on the principle of reduce, reuse, recycle. I truly believe in innovation and people's ability to problem solve. Imagine if you could easily reduce all green house gas emissions from coal/NGL plants, especially in China, down to zero or almost zero. This would have a positive impact on climate change and allow us to continue using current large capital projects. This would mean less waste and less mining for resources for new energy sources.

Where will the opportunities be in energy and the environment? Definitely in power generation and the areas of environment and waste management. There will be all kinds of work for people and the need for innovation in these areas. We still need to clean up our planet and we will need better and better ways of dealing with waste rather than dumping it and shipping it around the world.

Other Exciting Opportunities

What other exciting opportunities will there be in the future? We will still need many people in the trades. According to the Business Insider (Kiersz and Hoff, 2020) article we will need:

- sales and services
- lawyers
- market research analysts
- management analysts
- financial managers
- general and operations managers
- accountants and auditors
- customer service personnel

These positions will especially be needed in companies working in areas of the fourth industrial revolution. We will also need trades people including:

- plumbers, pipe fitters and steam fitters
- carpenters
- electricians
- construction managers and first line supervisors
- heavy and tractor trailer truck drivers

According to the Canadian Infrastructure Report Card (2016) we already needed to replace one third of our infrastructure years ago. We also need to replace another third right now, therefore there will be lots of jobs in construction and civil engineering.

Other trade related careers that our clients might want to consider are:

- elevator inspectors and maintenance
- pipeline Inspectors

With the construction of new buildings and the need to keep up maintenance on older buildings, elevator inspectors and maintenance personnel will be important. While not a super growth industry, there is still expected growth in this area. Many of our pipeline inspectors will be retiring over the next five years and these positions will also need to be filled. Check out other trade areas for industry growth rates.

Final Thoughts

We are moving away from the factory mindset of the second industrial revolution and even beyond the third industrial revolution of the computer era. The fourth industrial revolution will create more contract and less full-time employment. Our clients need to have entrepreneurial skills that will take them into this new era. The problem is that so few of our high school and post-secondary students have these skills. As well, many career changers may want to create their own businesses but are unable to because they do not have these business skills.

More and more I believe that all high school students should take at least one basic business class, including case studies to run their own business. I believe that all post-secondary students should take a second, more advanced, business class, including trade and economics, to better understand the world of work. Adding to this, a basic course in financial literacy would go a long way to preparing today's young people for tomorrow's world of work. I also see the need for more and more entrepreneurial programs for career changers and our plus 50 workers. Knowing how to run your own business will be a necessary skill of the fourth industrial revolution.

William Bridges stated, "Today's workers need to forget jobs completely and look instead for work that needs doing, and then set themselves up as the best way to get that work done." Jobshift - 1994

Which brings us back to Parsons. We need to know ourselves and we need to really understand business if we are going to be able to see the work that needs to be done.

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