



Greater Saskatoon Chamber of Commerce
Nov. 29, 2017 Luncheon Speech

***“Not Business as Usual:
Disruptive Innovation and the University of Saskatchewan”***

Good Afternoon

- Thank you for the opportunity to address you today.
- I want to thank the Saskatoon business community, many of whom are our alumni, for the critical support you provide to the U of S—whether it’s direct financial support, advice to our colleges and schools, or support for our students in co-op and internship programs. And I thank my colleagues who are here today to be part of this important event.
- I’ve said on many occasions that universities are more important now than they have ever been, and that the University of Saskatchewan is more important now than it has ever been. Today I’d like to suggest to you that our relationship with the City of Saskatoon is more important than it’s ever been. We are continuing to build that relationship, and it’s becoming a powerful one – one of the most outstanding in the country.
- I keep in mind that the UofS owns 18% of the land within a five-km radius of downtown, pays \$7.5M in municipal taxes, is responsible for 40% of the bus users, is connected to many local charities, offers many sports programs for children, and offers health and legal services in the inner city. We have an enormous responsibility to the City, and we need to honour it.
- We also have the potential to help the City address some of its most pressing challenges in land development, public policy, and research needs. And to partner with the City’s main cultural institutions – the SSO with whom we now have a partnership agreement, and the Remai Modern with whom we’ll have one very soon. The UofS and the City will also be signing a partnership agreement in the new year.
- Great cities need great universities, and deserve great universities. So a strategic relationship between the two is crucial.
- Our relationship with business in Saskatoon is more important, too, than it has ever been.
- Consider this recent stunning statement from Dominic Barton, global managing partner of McKinsey & Co. and chair of the federal Advisory Council on Economic Growth: Over the next decade, 40 per cent of jobs that currently exist in Canada will disappear as technology automates the work.

- Another report this year, this one by Dell Technologies, predicts that 85 per cent of the jobs that will exist in 2030 haven't even been invented yet.
- Not all experts foresee quite such a drastic impact of automation. But the C.D. Howe Institute's latest report does state that "labour market trends show a gradual shift to jobs that require higher skill levels" and that means, basically, that there will be a greater need for university training.
- While Saskatchewan's economy is becoming more knowledge intensive—with 44 per cent of the available jobs in the province requiring the skills and knowledge that a university education provides, only 25 per cent of Saskatchewan's workforce actually has a university education, underscoring the critical importance of investing in the higher education system. The good news is that at the U of S, we are training greater numbers of students every year and we're now up to almost 25,000 students from more than 100 countries.
- The pace of innovation today is so fast that some are calling this the "age of disruption" – an age in which new emerging technologies like artificial intelligence, next-generation genomics, and robotics are displacing established technologies, and in the process, they're changing the way we think, behave, do business, and learn.
- It's a lot of change for sure. But as I often tell myself and my colleagues, if you don't like change, you'll like irrelevance even less.
- The challenge is for universities and businesses to find ways to work more effectively together—and with their communities—to create the new jobs and businesses of the future.
- A few years ago, Forbes magazine started honouring people who were "disrupters" in the business community -- people whose work or discoveries or impact is uprooting an industry and also producing something new, more efficient and worthwhile.
- Think of how digital cameras both decimated Kodak's photo processing business and fundamentally changed how we take photos and share our experiences. Or think of the transformative impact of the iPhone which was launched just 10 years ago – there's more computing power in one iPhone than there was in all of NASA when it sent a man to the moon.
- The reality is that for many of today's high school students, the jobs they think that they want won't exist in 10 to 15 years.
- For instance, it was not predicted even 10 years ago that Saskatoon would be home to a dynamic high-tech sector, so "hot" that we are now racing to even remotely keep pace with the large number of computer scientists this burgeoning sector needs. U of S graduates are driving this.
- At Solido Design Automation Inc., which designs software to create chips for modern electronics, 53 of their 63 employees—a whopping 84 per cent—are U of S graduates. This month, in what is being reported as the largest technology acquisition in Saskatchewan's history, Siemens AG acquired Solido as part of their strategic investment in virtual simulation and design. The goal is to make Saskatoon a key R&D centre for their digital factory division. The conglomerate cited the presence of the

university and its proven ability to provide high-quality graduates as a key reason for the acquisition.

- What is certain is that the jobs today's students need to be prepared for will very likely grow out of innovative university research – both curiosity-driven and applied.
- In fact, it could be argued that major research universities like ours are the original disrupters.
- Think of the fact that U of S scientists Howard Johns and Sylvia Fedoruk revolutionized cancer treatment around the world when they developed the cobalt-60 technology for killing tumors—one of the world's first nuclear medicine scanning machines. An original "disruptor". (Acme)
- Or think of the how no-till farming revolutionized agriculture because it reduced summer fallow from 50% of the agricultural land annually to less than 1%. An original "disruptor". It's been calculated that since 1970, the combination of new crops developed at the U of S—400 new varieties in just 30 years—plus new direct seeding equipment developed in many cases by U of S engineering grads) has meant a \$50-billion benefit to Saskatchewan. An added benefit: our soil in this province is now a carbon sink, acting like a sponge to soak up the carbon compounds that are playing such an enormous role in global climate change.
- One more example: Pulses barely registered on the Canadian crop production graph back in 1970. Today, thanks to U of S agricultural research, Saskatchewan boasts a billion-dollar pulse crop industry and is the world leader in pea, lentil, and chickpea exports, staple foods in fast-growing countries such as India, China, Bangladesh, and northern Africa. Every pulse crop variety grown in Saskatchewan was developed at our university. An original "disruptor".
- And today the U of S, one of Canada's top 15 research universities, is again a leader in disruptive technologies that are helping Saskatchewan to stay ahead of the innovation curve. Without research, there is no innovation -- which is the principle, by the way, behind the Fundamental Science Review report now under consideration by the federal government.
- And the reality is, we can only do it with our partners in industry and communities.
- For instance, the U of S has become Canada's leading hub for crop genomics. At the U of S Global Institute for Food Security—founded with a \$50-million partnership involving PotashCorp, the Saskatchewan government and the U of S—we are combining cutting-edge plant science with computational techniques to transform the breeding of crops, including wheat, canola, and lentils. By linking specific genes to desired traits, we are working to improve drought, pest and stress-resistance in crops. Our goal is to be a unique resource for plant breeders around the world by 2022.
- Last year, the U of S led an international team—in partnership with the leading Israeli genomic "big data" company NRGene of Israel—that mapped the wheat genome sequence. And earlier this month, another U of S plant research team, working with the same company, has sequenced two wild lentil genomes—cutting-edge work aimed at breeding better lentils. Our scientists are now working with NRGene to sequence several more major global crops—innovative research that will have an immediate impact on

world food supplies. Mapping the genome is the path to creating stronger crops for different conditions worldwide.

- In health, we're building on our pioneering nuclear imaging work with today's disruptive technology—a new method for producing medical isotopes without using a nuclear reactor or creating radioactive waste. Canadian Isotopes Innovation, a branch of the U of S-owned Canadian Light Source, can produce a specific type of isotope used for medical diagnostic tests: of enormous significance given the imminent closure of Chalk River.
- And using our state-of-the-art cyclotron, we're producing medical isotopes for the diagnosis and treatment of cancer – a fitting homage to the Cobalt 60 work done here decades ago. Since June of 2016, we've been supplying Royal University Hospital with all its medical isotopes instead of bringing them in from Ontario. And over 2,000 patients have received PET/CT scans near their homes and families, instead of having to travel to health centres in other provinces. This new capability has also created jobs for technicians and highly qualified professionals in Saskatchewan, with more to come.
- We're a national leader in community-engaged health research, particularly in using robotic technology— fondly called “doctor in a box”—to deliver health care to people in the north so they don't have to leave their homes. It also reduces costs for the provincial health system. And new remote tele-robotic health techniques such as long distance ultrasound imaging are changing how we diagnose and treat chronic diseases for people without access to larger medical centres.
- Another disruptive technology we're developing at the CLS involves 3D printing to determine whether a brain aneurysm is about to burst, potentially causing a stroke. This work by Mohammed Izadifar could be a game changer for more accurate stroke prediction and ultimately for guiding surgery.
- VIDO-InterVac, we have commercialized eight animal vaccines including six world firsts. When the PED virus spread to North America in 2013, we managed to develop an improved vaccine before the virus infected Canada. The vaccine has been licensed to a commercial partner, which is manufacturing the vaccine and seeking regulatory approval for use in Canada and the U.S. This virus has killed more than eight million piglets in North America and cost swine producers more than \$400 million in lost income.
- Another disruptive technology we're advancing involves drones. Our Global Water Futures program, which has almost 140 partners around the world, is using drones to scan watersheds and monitor water flow changes so that we can better predict and manage droughts and floods. This type of innovation is one reason that we're number one in Canada for water resources research.
- These examples of exciting, transformative research underway on our campus underscore why we are attracting top talent from places like Australia, Germany, and the U.S., helping to make the city a more diverse and creative place – which in turn helps the city attract more talent.
- And these examples help demonstrate why the U of S leads Canada's 96 universities when it comes to per capita economic impact on the surrounding region.

- In sum, we are working to address specific industry and community challenges and to equip students with the skills and training they need for tomorrow's jobs—through discoveries, through spinoffs, and through graduating truly innovative thinkers and problem-solvers.
- Experts like Dominic Barton say the rapid pace of disruptive innovation means Canada must do a couple of key things to stay globally competitive.
- First, to advance innovation, there needs to be increased focus and support placed on Canada's key areas of strength—and here Barton repeatedly singles out the “agri-food” sector as a prime example.
- In this connection, you may have heard of the federal Superclusters Initiative that brings together companies and universities with the goal of creating thousands of well-paying jobs for this generation and the next. The U of S is proud to be part of the Protein Innovations Canada Supercluster proposal—one of nine short-listed proposals. It is led by Murad Al-Katib, the president of AGT Foods and Ingredients, one of the largest pulse suppliers in the world.
- Secondly, Barton says Canada has to greatly increase workforce participation—and particularly among Indigenous peoples for whom there is a significant education gap. About 27 per cent of Canadians have a university degree but fewer than 10 per cent of Indigenous people do.
- In a recent report, U of S economist Eric Howe has concluded: “The principal determinant of Saskatchewan's economic future will be Aboriginal education.” He says Saskatchewan's Aboriginal education gap costs the province \$1.1 billion in lost economic impact every year.
- At the U of S we are committed to working with Indigenous communities and the FSIN to close that gap and to ensuring the success of Indigenous students. Our innovative initiatives were profiled last year both in *The Atlantic* magazine and the *New York Times*, and include a program in Aboriginal languages, a Cameco Chair in Indigenous Health, and a new law degree program in Nunavut.
- We are increasing our Indigenous faculty and staff numbers, and recently created a high-level leadership position in Indigenous engagement. We have opened the beautiful Gordon Oakes Red Bear Student Centre as a gathering place for students of all backgrounds, and are including Indigenous symbols in our campus buildings.
- Content drawn from Indigenous experience and ways of knowing is being incorporated into all our degree programs across campus—not to supplant traditional western understanding, but to enrich it, acknowledge thousands of years of deep learning that occurred here long prior to it, and give all students a richer, more informed and ultimately more compassionate understanding of the world. Through this, the U of S will be an even better university.
- To increase student chances of success in the job market, we're providing more research opportunities for undergraduate students, we're increasing the numbers of graduate students (17% of our student population is at the graduate level, which puts us eighth highest in the country), and we're creating more work placements for our students.

- For instance, through the Edwards Co-operative Education program, we work with business partners to find our students work placements to complement their studies. More than 100 students participate and are placed each year, with 80 per cent of placements taking place right here in Saskatoon. To date, 92 per cent of students looking for work after completing the program have found full-time employment.
- PotashCorp was the first partner to join the College of Engineering in the Indigenous Peoples Industry Partnership Program which provides support for Indigenous engineering students with summer work placements and tuition assistance. Almost all the participants in that program have gone on to find employment with Potash.
- Because of our longstanding partnership with our renowned business alumnus Brett Wilson, countless business ideas have been generated on our campus in a diverse range of disciplines. Through 80-plus pitches delivered to Brett, more than 70 businesses have now been established by members of the U of S community.
- One such business is 3twenty Modular, a collaborative venture between a business grad and an engineering grad that builds modular buildings for the mining, oil and gas, and other markets. The firm, started in 2009, now has annual revenues exceeding \$5 million per year and employs 30 full-time staff and supports about 20 jobs in the sub-trades.
- But while there are many successes, there's no doubt the university faces some challenges in partnering better with business.
- For instance, we've learned that it has been difficult for business to know how to approach the university to collaborate on research. So we've revamped our industry liaison office and given it, under new leadership, a new vision with greater focus on entrepreneurship and student engagement.
- Our new Innovation Enterprise office has pioneered on this continent a Swedish approach to industrial collaboration called AIMday which brings together researchers and companies in day-long workshops to find solutions to specific industry problems. So far we've had two highly successful workshops—one for the mining sector and another for the imaging sector.
- When I spoke with you a year ago, we had no Provost nor VP University Relations and we were searching for nine deans. Today I can assure you we have a strong leadership team.
- Despite budget cuts, we must and will continue to think big, to tackle—with made-in-Saskatchewan solutions—the world's big challenges such as infectious diseases and food, water and energy security. With nearly 900 community partnerships in diverse fields in Canada and around the world, we are striving to connect Saskatchewan to the world.
- Barton has told university presidents that with the accelerating pace of innovation, we're leading in the most exciting time in human history. That may well be true.
- By seeking opportunities within Canada's innovation agenda, capitalizing on our unique research facilities and outstanding academic talent, and working with our partners in business, government and communities, we are striving to ensure that the people of Saskatchewan have access to world-class education and research.

- Cities have become the sites of greatest influence in Canada, the sites of the highest populations in Canada, and the sites of the greatest innovation in Canada. And our university is an innovation leader in Canada and the world. As we are saying at the UofS, we will govern ourselves not just on the basis of what we want to be, but what the world needs us to be.
- I'm grateful for this wonderful opportunity to say these things to you. We have a strong partnership with the City, and want to continue to develop – and to learn from you how to develop -- strong partnerships with its business community and that of the region and the province.
- Thank you very much.