



Western Economic  
Diversification Canada

Diversification de l'économie  
de l'Ouest Canada

# **Interoperability:**

## **An overview with a western perspective**

**Prepared by Western Economic Diversification Canada**

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## Interoperability: An overview with a western perspective

**Issue:** Western Canadian implement manufacturers have identified a major business challenge from the accelerated lock down of software on combines and tractors, which make implement brands incompatible with original equipment manufacturers' systems.

### **Context**<sup>1</sup>

Interoperability within the agricultural implements industry is part of interconnected public policy issues that have arisen because of new market dynamics created by digital technologies. These policy issues raise the importance of standards, and engage both federal and provincial areas of responsibility, including the following:

- copyright policy (e.g., are the exceptions in the law to permit the circumvention of technology protection measures (TPMs) adapted to this new reality);<sup>2</sup>
- competition policy (e.g., is competition in certain markets, including in the aftermarket for repair services, unduly restricted, and if so does this, or should this, constitute anti-competitive conduct);<sup>3</sup>
- consumer policy (e.g., should there be labelling obligations on businesses to warn consumers of use limitations prior to purchase);
- privacy policy (e.g., should personal information tracked by a device be portable from one platform to another on the Internet of Things (IoT));<sup>4</sup>
- environmental policy (e.g., how to address the increase in electronic waste);<sup>5</sup>
- provincial contract law and consumer protection laws (e.g., should there be a minimum lifetime guarantee on devices to limit planned obsolescence).<sup>6</sup>

The pace of technological change and the high business costs they add creates challenges for many SMEs and puts them at a disadvantage. Further, digital technologies have the potential to create new barriers, such as various forms of TPMs that allow manufacturers to maintain control of repair and the aftermarket and lifecycle of products to their advantage<sup>7</sup>. Challenges include:

- Lock-in customers – Large digital companies have an incentive to move away from interoperability and increase switching costs once they have reached a critical mass.<sup>8</sup>

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<sup>1</sup> The policy issues noted within the context section is not an exhaustive list and there are a number of additional areas of consideration, some inclusive of the agricultural implement manufacturers and others on the periphery or not as impactful to the sector but important considerations for general regulations. These additional areas could include standards development, health and safety policy, and future impacts such as automation, robotics and artificial intelligence dependent on the business, industry or product."

<sup>2</sup> Department of Justice Canada – "Infringement of Copyright and Moral Rights" - <https://laws.justice.gc.ca/eng/acts/C-42/page-18.html>

<sup>3</sup> Competition Bureau of Canada – "Highlights from the Competitions Bureau's Data Forum" - <https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04492.html#sec02>

<sup>4</sup> Office of the Privacy Commissioner Canada – "Summary of privacy laws in Canada" - [https://www.priv.gc.ca/en/privacy-topics/privacy-laws-in-canada/02\\_05\\_d\\_15/](https://www.priv.gc.ca/en/privacy-topics/privacy-laws-in-canada/02_05_d_15/)

<sup>5</sup> Electronic Products & Technology – "New E-waste regulation reduces electronic waste" - <https://www.ept.ca/2020/11/new-e-waste-regulation-reduces-electronic-waste/>

<sup>6</sup> Innovation Science and Economic Development – "Federal consumer protection legislation in Canada" - <http://www.ic.gc.ca/eic/site/oca-bc.nsf/eng/ca03084.html>

<sup>7</sup> Anthony D Rosborough, "Unscrewing the Future: The Right to Repair and the Circumvention of Software TPMs in the EU, 11 (2020) JIPITEC 26 para 1. - <https://www.jipitec.eu/issues/jipitec-11-1-2020/5083>

<sup>8</sup> IBID.

- Denied access to technology – The owner of Standard Essential Patents can control access to a standard and can deny access to entire markets (or segments). Access to standards is essential for device manufacturers.
- Interoperability issues – Interoperability facilitates interaction between different digital applications and platforms, which contributes to ease of market entry, promotes overall competitiveness and strengthens innovation. The owner of such platforms can deny access. Being able to access the infrastructure of a given platform allows other businesses (mostly SMEs) to innovate and unlock downstream markets.<sup>9</sup>

These challenges are making it difficult for SMEs in the manufacturing sector to compete based on merits, and delaying their ability to introduce innovative products and services, which weakens the overall sector growth and competitiveness. There have also been concerns voiced that the use of TPMs by original equipment manufacturers limit competition and reduce innovation in the agricultural equipment industry by making reverse engineering more difficult.<sup>10</sup>

### **Approaches in Other Countries**

Most states have a legal framework that informs when TPMs may be circumvented, but states tend to differ on how this framework is implemented and how rights are determined. See annex I for a table on how specific countries are categorized on their implementation strategies with respect to TPMs. Of the mechanism used in other countries' enabling exceptions for anti-circumvention legislation, the United States is the most relevant example. The United States has recently created a repair exception to their anti-circumvention legislation that closely models Canada's regulatory options for creating such an exception.

#### **United States**

In October 2018, the United States adopted a limited temporary exemption from the general prohibition against circumvention of TPMs, for the purposes of diagnostic, maintenance, and repair of classes of computer-controlled devices. This exemption is in addition to an existing one for automobiles.

Within the United States, the Digital Millennium Copyright Act has acknowledged ambiguity as its unclear to what extent consumers can legally have third party assistance in circumventing TPMs in pursuit of device repair. Further legislative action on the right to repair have been opposed and heavily lobbied against by large industry stakeholders, notable Apple and John Deere.<sup>11</sup>

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<sup>9</sup> IBID.

<sup>10</sup> Standing Committee on Industry, Science and Technology number 003, 1<sup>st</sup> session, 43 parliament 'Evidence' Monday February 24, 2020 - <https://www.ourcommons.ca/DocumentViewer/en/43-1/INDU/meeting-3/evidence>

<sup>11</sup> Christopher Baugh, "Apple Pushes Back Against 'Right to Repair' Legislation in the U.S." (22 June 2017), iPhone in Canada, online: [https://www.vice.com/en\\_ca/article/k7ekzw/maryland-suddenly-looks-like-it-might-break-john-deeres-repair-monopoly](https://www.vice.com/en_ca/article/k7ekzw/maryland-suddenly-looks-like-it-might-break-john-deeres-repair-monopoly); Elizabeth Chamberlain, "John Deere Just Swindled Farmers out of Their Right to Repair", (19 September 2018), Wired, online: < <https://www.wired.com/story/john-deere-farmers-right-to-repair/>>.

## European Union (EU)

The EU does not possess a single, union wide copyright structure but has a patchwork of Directives and Regulations some of which touch on copyright. EU agreements predate international development and is more onerous particularly in the area of software.<sup>12</sup>

In March 2020, the European Commission announced a new environmental and economic action plan that proposes a number of legislative and regulatory initiatives to help consumers with repairs. Initiatives contemplated include creating new rights for consumers regarding availability of spare parts or access to repair and development of a specific [policy on 'Interoperability'](#).

## **Industry Data**

### Canadian and Western Agricultural Implements Sector

DISCLAIMER: The section below looks at industry data, specifically from the NAICS 33311 code for agricultural implement manufacturing, from as recent as 2019 and as far back as 2017. All attempts to use the most recent data and a common year were made but access was limited given the time frame to complete this write-up.

Building on Western Canada's natural advantages in agriculture, producers have created a dynamic, globally integrated, value-added sector, which spans across agricultural equipment, food and beverage manufacturing, and ag-biotechnology innovations in plant and animal technology. Western Canada is also a leader in dry land farming technology, sustainable land and water management, and farm ecosystem management.

Nationally this sector accounts for total revenues over \$4 billion with western Canada accounting for a dominant share, 65.9 percent, of Canadian agricultural equipment manufacturing. In 2018, agricultural equipment manufacturing in Western Canada contributed an estimated \$2.6 billion in revenue with total salaries and wages accounting for \$488 million\*.<sup>1314</sup>

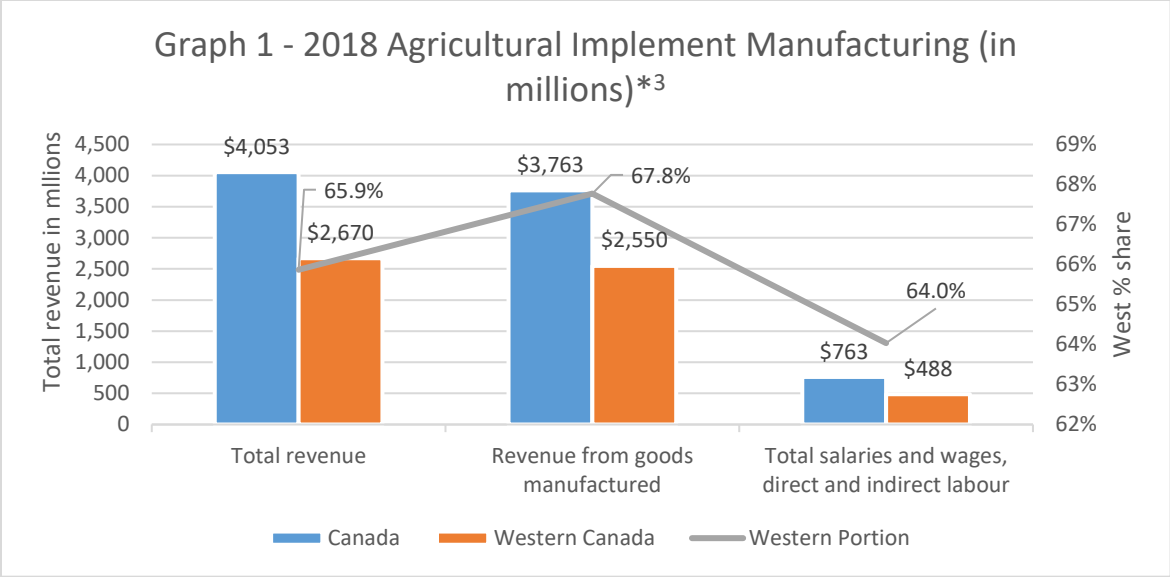
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<sup>12</sup> Anthony D Rosborough, "Unscrewing the Future: The Right to Repair and the Circumvention of Software TPMs in the EU" EU, 11 (2020) JIPITEC 26 para 1 - <https://www.jipitec.eu/issues/jipitec-11-1-2020/5083>

<sup>13</sup> Statistics Canada Cansim Table 301-0008

\*Data for British Columbia salaries and wages was suppressed due to confidentiality but accounts for a very small portion of total revenue, 1.7 percent, thus the number represents a slightly smaller amount of total salaries for the West.

<sup>14</sup> Source - Statistics Canada Table: 16-10-0117-01; NAICS 33311



A sample of 81 Canadian businesses shows the following distribution based on annual sales:

Start-up & \$0-\$3M	25
\$3-\$10M	20
\$10-40M	25
\$40-\$60+M	11

In addition, 80 percent of the business from table 1 are located in the Prairie Provinces further showing the strength of this industry in the west.

<sup>15</sup> Numbers provided by Agricultural Manufacturers of Canada

## Employer Establishments

In 2019 within Canada, there were 529 agricultural implement manufacturing businesses with 87.7

**TABLE 2 - Employer establishments by employment size category and province/territory (2019)<sup>16</sup>**

**Employment size category (number of employees)**

Province/territory	Micro (1-4)	Small (5-99)	Medium (100-499)	Large (500+)
Ontario	22	48	7	0
Quebec	15	42	7	0
Alberta	12	19	3	0
Manitoba	10	34	6	1
Saskatchewan	10	27	10	3
British Columbia	5	7	0	0
New Brunswick	3	2	0	0
Nova Scotia	1	1	0	0
Prince Edward Island	1	5	0	0
Western Canada	37	87	19	4
Canada	79	185	33	4
Canada % distribution of businesses with employees (301)	26.2	61.5	11	1.3

percent of the employment represented by micro (1-4 employees) and small establishments (5-99 employees). Of these 529 businesses, 301 have one or more employee. From businesses with employees Western Canada accounted for 48.8 (147 of 301) percent of all businesses. The west has a higher proportion, 57.6 percent (19 of 33) medium sized establishments (100-499 employees) and

100% of all large establishments (4 of 4). See table two for further details.

## Financial Performance

Based on 2018 data for small and medium sized enterprises, industry averages for revenue was \$996,900 with 72 percent of establishments being profitable. Financial performance data was reported for 311 businesses with an annual revenue range of \$30,000 to \$5 million. The information reported below outlines the average revenues and profits for these small and medium-sized enterprises. While not representative of the whole industry, in particular, the larger agricultural implement manufacturers, the information from table 3 could be useful in extrapolating broader impacts to the industry.

<sup>16</sup> Statistics Canada, special tabulation, unpublished data, unclassified excluded, 2019; from - <https://www.ic.gc.ca/app/scr/app/cis/businesses-entreprises/33311>

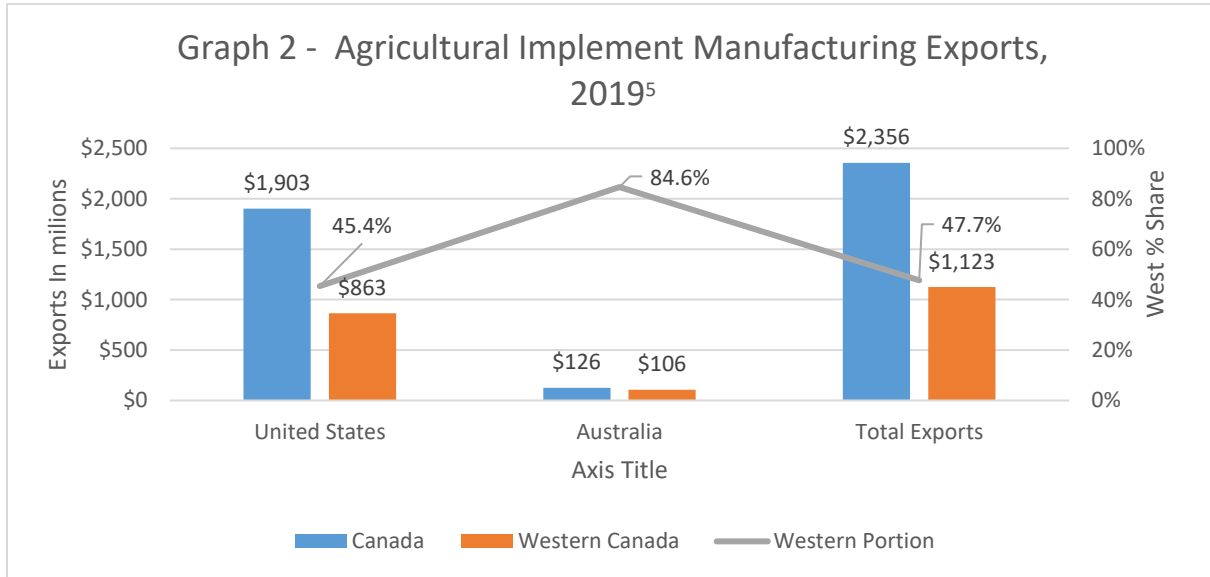
Table 3 - Financial Performance - Report by revenue in thousand of dollars <sup>17</sup>						
	Whole industry	Bottom quartile (25%)	Lower middle (25%)	Upper middle (25%)	Top quartile (25%)	Percentage businesses reporting
Number of businesses	311					
Revenue range:						
Low (\$000)	30	30	129	476	1,520	
High (\$000)	5,000	129	476	1,520	5,000	
	(thousands of dollars) - Averages					
<b>REVENUES AND EXPENSES</b>						
Total revenue	996.9 <sup>B</sup>	73.9	261.3	972.8	2,679.40	100
Cost of sales (direct expenses)	623.8 <sup>B</sup>	28.8	125.5	566	1,774.90	83.9
Net profit/loss	85.5 <sup>B</sup>	5.5	5.8	102.5	228.1	100
	<b>FINANCIAL RATIOS</b>					
	Averages					
Gross margin (%)	37.4	61	52	41.8	33.8	
	<b>PROFITABLE vs NON-PROFITABLE BUSINESSES</b>					
	(thousands of dollars)					
<b>Profitable</b>						
Percentage of businesses (%)	72	N/A	N/A	N/A	N/A	
Total revenue	1,114.1 <sup>B</sup>	75.1	271	988.4	2,744.40	
Total expenses	943.2 <sup>B</sup>	52.9	206.2	811.2	2,375.40	
Net profit	170.9 <sup>C</sup>	22.2	64.9	177.2	369	
<b>Non-Profitable</b>						
Percentage of businesses (%)	28	N/A	N/A	N/A	N/A	
Total revenue	695.1 <sup>B</sup>	71.9	244	917	2,407.70	
Total expenses	829.5 <sup>C</sup>	97.7	343.2	1,081.30	2,769.10	
Net loss	-134.4 <sup>E</sup>	-25.9	-99.2	-164.3	-361.5	

For this subset of data from table 3, overall industry gross margins are healthy at 37.4 percent with the average net profit for the whole industry sitting at \$85,500. As revenues increase, the gross margins are reduced, with the top quartile's reporting a gross margin of 33.8 percent. Further, the net profit margin for profitable companies' decreases as we move from the bottom quartile to the top from is 29.6, 23.9, 17.9 and 13.4 percent respectively. Loss in sales from interoperability will further affect companies' profitability.

<sup>17</sup> Statistics Canada – Financial Performance Data; from <https://www.ic.gc.ca/app/scr/app/cis/performance/rev/33311>

Industry Trade

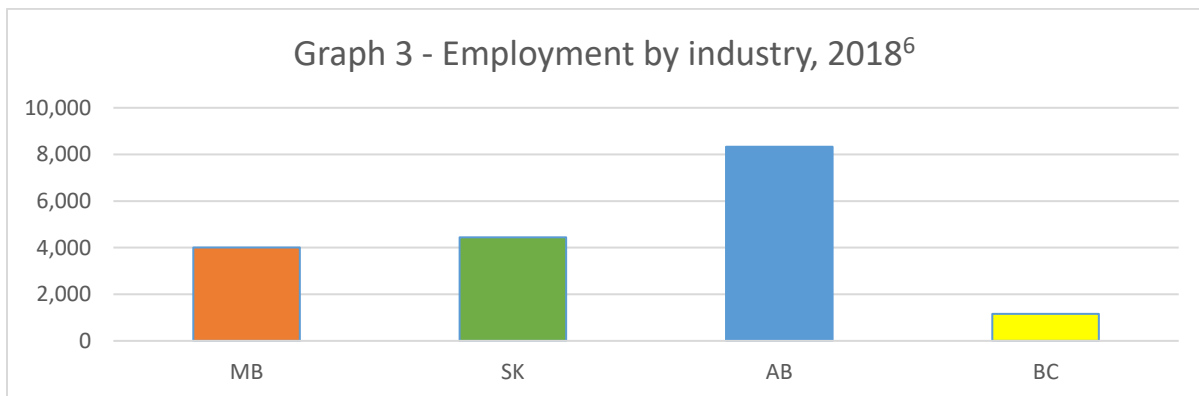
Graph 2 denotes the exports in agricultural implements to the two largest countries, the United States and Australia, along with total exports to all countries. A further breakdown of Western Canada is denoted in orange. In 2019, Western Canada accounted for just under half, 47.7 percent of agricultural implement manufacturing exports accounting for \$1.12B in revenue.<sup>18</sup>



Industry Employment

Note this section included a broader measure than NAICS 33311 and includes construction and mining equipment.

Looking at employment, which includes agricultural, constructing and mining equipment for western Canada this accounts for 17,941 annual employees or 57.3 percent of the nation’s jobs in this industry classification.<sup>19</sup>



<sup>18</sup> Trade Data Online - <https://www.ic.gc.ca/eic/site/tdo-dcd.nsf/eng/home>

<sup>19</sup> Statistics Canada. [Table 14-10-0202-01 Employment by industry, annual](#)



## Industry Sales Impacts

Impacts of interoperability will be affecting the industry in 2020 as one OEM's starts restricting access to short line manufactures equipment. A survey of implement dealers has indicated a significant drop in orders of short line manufacture combine headers for the coming year and in to the future.

From table 4, dealers of agriculture equipment have indicated a reduction in intentions to purchase headers from short line manufactures base on the past five-year average. The current sales, specifically in OEM 1 mainline dealers, could see sales numbers decreasing by as much as 60 percent this year over the five-year average. A further reduction in future sales is predicted moving forward. Dealers have indicated that sales on new combines of short line headers have reduced significantly or have been zero due in part to new headers introduced by John Deere over the last few years. One dealer in Alberta has indicated an increase in short line header sales due to the better offerings for the harvested terrain.<sup>20</sup>

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<sup>20</sup> Numbers provided by the Western Equipment Dealers Association.

Table 4 - Agriculture Implement Dealer Portion of Header Sales<sup>21</sup>

Dealer Location	Mainline	Locations	OEM			Short Line Manufacturers'		
			Past 5 Years	Current	Future	Past 5 Years	Current	Future
Saskatchewan	OEM 1	23	50%	95%	95%	50%	5%	5%
Saskatchewan	OEM 1	13	40%	80%	5%	60%	20%	5%
Saskatchewan	OEM 1	24	40%	95%	95%	60%	5%	5%
Alberta	OEM 1	14	20%	80%	95%	80%	20%	5%
British Columbia	OEM 1	12	75%	75%	95%	25%	25%	5%
Alberta	OEM 1	8	50%	50%	45%	50%	50%	65%
Manitoba	OEM 1	14	80%	80%	95%	20%	20%	5%
	61% closed to shortline	<b>108</b>						
Saskatchewan	OEM 2	43	10%	10%	10%	90%	90%	90%
Saskatchewan	OEM 2	9	5%	5%	5%	95%	95%	95%
Saskatchewan	OEM 3	14	10%	10%	10%	90%	90%	90%
Saskatchewan	OEM 4	3	5%	15%	25%	95%	85%	75%
	39% open to shortline	<b>69</b>						
	<b>TOTAL</b>	<b>177</b>						

<sup>21</sup> IBID.

## Country Categorization of TPM Implementation Strategies

<b>Legal Mechanism for anti-circumvention exceptions:</b>	<b>Example Countries:<sup>22</sup></b>
Statutory anti-circumvention exceptions for circumvention	United States Canada Australia Japan India <sup>23</sup> United Kingdom
Regulatory power to create exceptions for circumvention	United States Canada
Regulatory power to impute access obligations on rights holder	Canada Netherlands
Mandatory mediation between rights holder and beneficiary of a copyright exception or limitation	Greece Lithuania Slovenia
Administrative complaint procedure for the beneficiary of a copyright exception or limitation	United Kingdom <sup>24</sup>
Direct access to courts for the beneficiary of a copyright exception or limitation (injunctive relief)	Ireland Germany Luxembourg
Wait-and-see policy strategy	Austria Netherlands

<sup>22</sup> Urs Gasser, "Legal Frameworks and Technological Protection of Digital Content: Moving Forward towards a Best Practice Model" (2006) 17:2 Fordham Intellectual Property, Media and Entertainment Law Journal 39 at 75 to 87.

<sup>23</sup> India allows circumvention of TPMs for any purpose not expressly prohibited in its legislation, such as product repair, but requires that a record of contact details be made of anyone who is directly involved in circumvention. HUN-15,8[1][c][ii] of International Copyright Law and Practice, volume 2.

<sup>24</sup> The procedure in the United Kingdom involves an investigation by the Secretary of State into whether a voluntary measure or agreement is present. The Secretary of State can conclude the investigation with direction for which the rights holder has a statutory duty to comply.