CARL DATA SOLUTIONS INC.

MANAGEMENT'S DISCUSSION & ANALYSIS
FOR THE YEAR ENDED JUNE 30, 2019

General

This Managementôs Discussion and Analysis (ñ**MD&A**ò) of CARL Data Solutions Inc. (ñ**CARL**,ò or the ñ**Company**ò) is dated October 22, 2019 and provides a review of the Companyôs financial results, from the viewpoint of management, for the year ended June 30, 2019 (ñF2019-Q4ò) compared to the year ended June 30, 2018 (ñF2018-Q4ò).

The following information should be read in conjunction with the Companyôs audited consolidated financial statements with accompanying notes for the fiscal year ended June 30, 2019 (ñF2019ò), which were prepared in accordance with International Financial Reporting Standards (ñIFRSò).

All dollar figures are expressed in Canadian dollars unless otherwise stated. These documents and additional information on the Company are available on the SEDAR website at www.sedar.com.

Cautionary Statement Regarding Forward-Looking Statements

Certain statements contained in this document constitute ñforward-looking statementsò. When used in this document, the words ñmayò, ñwouldò, ñcouldò, ñwillò, ñintendò, ñplanò, ñproposeò, ñanticipateò and ñbelieveò, are intended to identify forward-looking statements. Such statements reflect the Companyôs ñforecastò, ñestimateò, ñexpectationò and similar expressions as they relate to the Companyôs current views with respect to future events and are subject to certain risks, uncertainties and assumptions.

The forward-looking statements contained in this MD&A are made as of the date hereof and represent the Companyôs views as of the date of this document. While the Company believes that the expectations reflected in the forward-looking statements and information contained herein are reasonable, no assurance can be given that these expectations, or the assumptions underlying these expectations, will prove to be correct. The Company acknowledges that subsequent events and developments may cause the views expressed herein to change, however, the Company has no intention and undertakes no obligation to update, revise or correct such forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable securities law. Therefore, there can be no assurance that forward-looking statements contained herein will prove to be accurate as actual results and future events could differ materially from those expected or estimated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements.

Description of Business

CARL Data Solutions Inc. (ñ**CARL**ò or the ñ**Company**ò) was incorporated under the Business Corporations Act (British Columbia) on January 17, 2014. CARL is a developer of Big-Data-as-a-Service (ñ**BDaaS**ò)-based solutions, providing the next generation data collection, storage and analytic solutions for data-centric companies.

CARL is a public company that is listed on the Canadian Securities Exchange (ñ**CSE**ò) (under the symbol: CRL), the Frankfurt Stock Exchange (under the symbol: 7C5) and the OTC Pink (under the symbol: CDTAF). The head office and principal address of the Company is located at Suite 488 ï 1090 West Georgia Street, Vancouver, British Columbia, V6E 3V7. The Companyôs consolidated financial statements include the financial statements of the following subsidiaries:

Company	Place of Incorporation	Effective Interest
Extend to Social Media Inc. (ñ**ETS**ò)	British Columbia	100%
FlowWorks Inc. (ñ**FlowWorks**ò)	Washington, USA	100%
Carl Data Solutions PL (ñ**Carl PL**ò)	Poland	100%
Astra Smart Systems Inc. (ñ**Astra**ò)	British Columbia	100%

CARL has spent the past year identifying, closing and integrating the Astra subsidiary into the core business which has been mainly the operations of FlowWorks. The strategy has been to build the internal development team to create the software platforms and build a world class technology team to create the Infrastructure as a service layer including data center assets. This team has been sourced across three continents to attract the best talent available. CARL now has all the elements in place to successfully take on the Industrial Internet of things (ñ**IIoT"**) space as required for smart cities.

The combined capabilities of the teams allow the Company to respond to the demands and visions of individual utilities within a smart city environment delivering smart water and waste solutions that not only harness the world of IIoT sensors and on site data loggers that are connected to the cloud, but also artificial intelligence algorithms and global predictive data to overlay future demands and imponderables such as weather fluctuations and product of service utilization.

This unique platform has now been adopted by numerous cities across the US and Canada and is performing well, collecting enormous data sets from CARLøs own IIoT sensors and a myriad of third-party end point devices. Embedded within the platform is an anomaly detector that sifts out the erroneous or irrelevant data points that can easily create false negatives and mislead decision making. The clean and relevant data is then analysed, overlaying predictive artificial intelligence then presenting the new, real time data in an easy to interpret dashboard for rapid and collaborate decision making.

The addressable markets of water and waste are significant but with its new technology agnostic data gathering, analytics and artificial intelligence engine, the Company is in a good position for strong growth in the smart city and building sector.

Going Concern

The Companyøs consolidated financial statements have been prepared on a going concern basis, which assumes that the Company will be able to meet its obligations and continue its operations for its next fiscal year. Realization values may be substantially different from carrying values as recorded in these audited consolidated financial statements. The Companyøs consolidated financial statements do not give effect to adjustments that would be necessary to the carrying values and classification of assets and liabilities should the Company be unable to continue as a going concern. At June 30, 2019, the Company had not achieved profitable operations, had accumulated a deficit of $17,058,207 since inception and expects to incur further operating losses in the development of its business. The Companyøs ability to continue as a going concern is dependent upon the ability to develop its business units, develop marketable software, potentially find, acquire and develop various other business segments with growth potential, its ability to obtain the necessary financing to carry out this strategy, and to meet its corporate overhead needs and discharge its liabilities as they come due. Although the Company has been successful in the past in obtaining financing, there is no assurance that it will be able to obtain adequate financing in the future or that such financing will be on terms advantageous to the Company. These matters indicate material uncertainties that may cast significant doubt about the Companyøs ability to continue as a going concern.

Selected Financial Information

The following sets out selected consolidated financial information of the Company for the period indicated, which has been derived from the Companyøs audited consolidated financial statements. Users of this information should read the following in conjunction with those statements and the previously filed annual statements.

		June 30, 2019		June 30, 2018		June 30, 2017
Total Revenue	$	1,650,426	$	1,258,912	$	1,190,399
Total Expenses		4,979,759		6,033,581		4,115,333
Net Loss		(3,368,600)		(4,708,518)		(4,616,764)
Basic and Diluted Loss per Share		(0.04)		(0.08)		(0.12)
Total assets		3,122,044		4,385,604		1,423,721
Non-current financial liabilities		225,000		10,000		357,999

Recent Events & Overall Performance

Completed Private Placements and share issuances

During the year and subsequent to the year ended June 30, 2019, the Company had the following share transactions:

(i) On August 31, 2018, the Company repurchased and returned to treasury 184,440 common shares at a price of US$0.225 per share pursuant to a settlement agreement entered with the former dissenting shareholder.

(ii) On October 22, 2018, the Company issued 330,000 common shares at a price of $0.105 per common share, for a total value of $34,650, to settle accounts payable with a director of $33,000. The Company recognized a loss of $1,650 on the settlement.

(iii) On October 22, 2018, the Company issued 214,285 common shares at a price of $0.105 per common share, for a total value of $22,500, to settle finance fees on a short-term loan previously accrued at $30,000. The Company recognized a gain of $7,500 on the settlement.

(iv) On November 30, 2018, the Company issued 400,000 common shares at a price of $0.485 per common shares, for a total value of $194,000, as required per the acquisition of the AB Embedded assets.

(v) On December 19, 2018, the Company repurchased and returned to treasury 36,888 common shares at a price of US$0.225 per share pursuant to a settlement agreement entered with the former dissenting shareholder.

(vi) On January 14, 2019, the Company repurchased and returned to treasury 36,888 common shares at a price of US$0.225 per share pursuant to a settlement agreement entered with the former dissenting shareholder.

(vii) On February 20, 2019, the Company issued 210,000 common shares at a price of $0.11 per common share to a director of the Company in settlement of $31,500 of accounts payable.

(viii) On April 24, 2019, the Company repurchased and returned to treasury 36,888 common shares at a price of US$0.225 per share pursuant to a settlement agreement entered with the former dissenting shareholder.

(ix) On July 11, 2019, the Company repurchased and returned to treasury 36,888 common shares at a price of US$0.225 per share pursuant to a settlement agreement entered with the former dissenting shareholder.

(x) On July 30, 2019, the Company issued 1,000,000 to settled accounts payable and accrued liabilities of $100,000.

(xi) On August 14, 2019, the Company closed a private placement by issuing 4,000,000 common shares units (each, a ñUnitò) at a price of $0.20 per Unit for gross proceeds of $800,000. Each Unit consisted of one common share and one half of one common share purchase warrant with each whole warrant entitling its holder to purchase one additional common share for a period of two years at a price of $0.50 per common share. In connection with the offering, the Company paid a finderôs fee of $64,000.

(xii) On October 17, 2019, the Company repurchased and returned to treasury 36,888 common shares at a price of $0.225 per share pursuant to a settlement agreement with the former dissenting shareholder.

Short-Term Loans

During the year and subsequent to the year ended June 30, 2019, the Company entered into the following loan agreements:

a) $300,000 from an armôs-length party with a maturity of September 13, 2018. In connection with the loan, the Company agreed to pay interest of $15,000 and issue 214,285 common shares on maturity (issued). Additional interest is payable on the loan amount at the rate of $15,000 for any and every part of 59 days that the loan is outstanding after the maturity. The Company settled the principal of $300,000 during the year ended June 30, 2019 through the issuance of a convertible note in the same amount;

b) $100,000 from an armôs-length party with a maturity of January 26, 2019. In connection with the loan the Company agreed to pay a transaction fee of $5,000 and issue 64,516 common shares. Since the loan was not repaid by January 26, 2019, interest of 13% per annum is accruing on the principal amount of $100,000. As at June 30, 2019, $10,000 relating to the common shares has been accrued to commitment to issue shares and $5,000 in transaction fees has been included in the balance of loans payable;

c) $50,000 from an armôs-length party, repayable on demand and non-interest bearing;

d) $90,000 from two directors of the Company with maturities of January 31, 2019. In connection with the loans, the Company will pay 20% simple interest per annum after the maturity date. As at the date of this report, the loans remain outstanding;

e) $225,000 was received from an armôs-length party on December 3, 2018 bearing interest of prime plus 2.5% on a monthly basis. After 24 months, the Company will make monthly payments over 60 months inclusive of principal and interest component; and

f) an aggregate of $235,000 received from four loans with an armôs-length party all with maturities of December 31, 2019 bearing interest at a rate of 15% per annum.

Convertible notes

During the year and subsequent to the year ended June 30, 2019, the Company issued the following convertible notes:

a) $300,000 issued on December 24, 2018, bearing interest at a rate of 12% per annum and maturing on December 24, 2019. The principal and interest, at the option of the holder, will be convertible into common shares of the Company at a conversion price of $0.15 per common share;

b) $300,000 issued on December 27, 2018 in settlement of loans payable, bearing interest at a rate of 12% per annum and maturing on December 27, 2019. The principal and interest, at the option of the holder, will be convertible into common shares of the Company at a conversion price of $0.15 per common share;

c) $70,000, bearing interest at a rate of 10% per annum and maturing on July 28, 2019. The principal and interest, at the option of the holder, will be convertible into common shares of the Company at a conversion price of $0.15 per common share. Subsequent to the year ended June 30, 2019 the noteôs maturity was extended to October 28, 2019;

d) $60,000, bearing interest at a rate of 10% per annum and maturing on July 28, 2019. The principal and interest, at the option of the holder, will be convertible into common shares of the Company at a conversion price of $0.15 per common share. Subsequent to the year ended June 30, 2019 the noteôs maturity was extended to October 28, 2019; and

e) Received proceeds in advance on a series of five notes with an aggregate value of $300,000 bearing interest at a rate of 12% per annum and with a one year maturity. The principal and interest, at the option of the holder, will be convertible into common shares of the Company at a conversion price of $0.30 per common share.

Granting of Stock options

On January 22, 2015, the Company adopted an incentive stock option plan. Under the terms of this plan, the total number of share purchase options to be granted and outstanding may not exceed 10% of the total issued and outstanding common shares of the Company at the date of grant. Options may be granted with an exercise price equal to the market price of the common shares less any permitted discount on the grant date, vest according to privileges set at the time the options, have a minimum price of $0.10 and are granted and expire no later than five years from the date of grant.

During the year and subsequent to the year ended June 30, 2019, the Company had the following stock option issuances:

(i) On September 14, 2018, the Company cancelled the following options:

  (i) 919,600 expiring January 19, 2021 with an exercise price of $0.40;
  (ii) 565,247 expiring August 24, 2021 with an exercise price of $0.45; and
  (iii) 684,939 expiring March 20, 2022 with an exercise price of $0.36.

(ii) On May 1, 2019, the Company cancelled 25,000 options expiring October 14, 2022 with an exercise price of $0.14.

(iii) On October 15, 2018, the Company granted 3,995,247 stock options to various directors, officers, employees, and consultants with a life of four years and an exercise price of $0.14.

Summary of Quarterly Results

Key financial information for the quarters spanning the two most recent fiscal years is summarized as follows, reported in Canadian dollars:

	June 30, 2019	March 31, 2019	December 31, 2018	September 30, 2018
Revenue	$ 398,943	$ 334,801	$ 450,220	$ 466,462
Operating expenses	1,313,245	1,054,703	1,247,536	1,364,275
Loss for the period	(912,340)	(718,410)	(808,207)	(929,643)
Basic and Diluted Loss per share	(0.01)	(0.01)	(0.01)	(0.01)
Assets	3,122,044	3,383,664	3,755,001	3,786,595
Liabilities	2,635,291	1,985,785	1,708,767	1,285,729
Shareholdersô Equity	486,753	1,397,879	2,046,234	2,500,866

	June 30, 2018	March 31, 2018	December 31, 2017	September 30, 2017
Revenue	$ 365,499	$ 280,808	$ 250,076	$ 362,529
Operating expenses	1,393,741	981,772	2,418,821	1,239,247
Loss for the period	(564,422)	(697,639)	(2,173,793)	(1,272,664)
Basic and Diluted Loss per share	(0.01)	(0.01)	(0.04)	(0.03)
Assets	4,385,604	2,925,440	1,681,410	1,435,275
Liabilities	987,015	798,921	1,898,047	1,125,277
Shareholdersô Equity (Deficiency)	3,398,589	2,126,519	(216,637)	309,998

Fourth Quarter

Revenue in the fourth quarter of the year ended June 30, 2019 of $398,943 did not change materially from the comparable quarter ended June 30, 2018 at $365,499. Higher revenues for the quarter ended June 30, 2019 was a result of the timing of completion of various custom programming service contracts, which occur on a periodic basis. Expenses for the fourth quarter ended June 30, 2019 of $1,313,245 was mostly in line with the comparable period and most quarters for the two years, excluding December 31, 2017 which had significant investor relations fees, primarily as a result of costs bore in the acquisition of Astra.

Discussion of Year End Operations

Revenue

For the year ended June 30, 2019, the Company generated $1,650,426 in revenues (2018 - $1,258,912) of which $1,125,520 (2018 - $1,111,681) related to revenue generated by FlowWorks, $96,600 (2018 - $96,600) related to revenue generated by ETS, $407,911 (2018 - $40,044) related to revenue generated by Astra, and $20,395 (2018 - $10,587) generated from the provision of digital currency verification services. Revenue from FlowWorks is comprised of service fees from its web-based application used for data analysis in addition to set-up fees and custom programming service contracts. The comparable for FlowWorks included custom programming fees for a one-time project, and accordingly, the Company saw a decrease in revenues from FlowWorks. The overall increase in revenues is primarily a result of additional revenue generated from data hosting services which commenced with the acquisition of Astra on June 18, 2018.

Operating Expenses and Other Items

Operating expenses and other items with significant variances and balances include:

Amortization

Amortization for the year ended June 30, 2019 was $752,169 (2018 ï $338,160). During the year ended June 30, 2018, on the business combinations of AB Embedded and Astra, the Company acquired five new finite life intangible assets which are to be amortized over periods of three or four years. The amortization expense for the year ended June 30, 2019 captures the new amortization for intangibles from acquisition plus amortization of previously acquired FlowWorks assets. Further, late in the year ended June 30, 2018, the Companyös previously identified software in development became available for use and the Company started amortizing it from January 1, 2018.

Computer Hosting Costs

Computer hosting costs for the year ended June 30, 2019 were $408,621 (2018 ï $286,403). The additional hosting costs were incurred as a result of running the Companyös new platform in tandem with its former and management does not expect these to persist in the future.

Consulting fees

Consulting fees for the year ended June 30, 2019 were $878,855 (2018 ï $824,172). Consulting fees are primarily used for contracts with software developers and for management and movement between the two years is considered reasonable considering the addition of staff in the Astra business unit. During the year ended June 30, 2019, the Company recognized $80,789 for shares issued on the one-year anniversary of the AB Embedded business combination, which explains a significant portion of the change.

Depreciation

Depreciation for the year ended June 30, 2019 was $225,889 (2018 ï $53,271). On November 30, 2017, the Company acquired tangible assets through the business combinations of AB Embedded and Astra and paid $250,000 for the acquisition of processors to be used for digital currency verification services for which the Company started recognizing depreciation.

Energy Costs

Energy costs for the year ended June 30, 2019 were $232,803 (2018 - $nil). Late in the year ended June 30, 2018, the Company completed the acquisition of Astra and started providing data hosting services. In performing these services, the Company now incurs significant energy costs which it expects will increase as the Company further develops its data hosting offerings.

Interest and Penalties

Interest and penalties for the year ended June 30, 2019 were $89,348 (2018 ï $85,508) which are considered comparable between the two periods.

Investor Relations

Investor relations expense for the year ended June 30, 2019 was $236,848 (2018 ï $1,973,261). During the comparative period, the Company entered into multiple investor relations contracts in advance of its rights offering for a large-scale short-term investor relations campaign. The Company does not expect these costs to persist and is focusing on reducing its investor relations expenditures.

Office and miscellaneous

Office and miscellaneous costs for the year ended June 30, 2019 were $187,295 (2018 ï $185,581). The Company experienced significant growth during the year ended June 30, 2018 with the business combinations of AB Embedded, Carl PL, and Astra, but has now levelled out and the expenditures are considered consistent.

Professional fees

Professional fees for the year ended June 30, 2019 were $293,598 (2018 ï $301,041). Professional fees include audit and accounting fees and legal fees and are considered comparable to the prior period.

Share-based payments

Share-based payments for the year ended June 30, 2019 were $285,661 (2018 ï $409,282). The expense relates primarily to stock options granted and vested during the period and are not expected to be comparable over the three periods as the expense is dependent on the timing of grants and vesting schedules.

Salaries and wages

Salaries and wages for the year ended June 30, 2019 were $870,546 (2018 ï $931,807). The decrease in salaries and wages is primarily a result of a grant received during the period to cover salaries for Carl PL.

Travel

Travel expenses for the year ended June 30, 2019 were $94,753 (2018 ï $180,783). The decrease in travel is a result of management initiatives to reduce overall expenditure to conserve working capital.

Financing Costs

Financing costs for the year ended June 30, 2019 were $45,000 (2018 ï $292,028). Financing costs in the comparable period related exclusively to royalties paid and fully satisfied on the CompanyÕs convertible debenture, which was primarily settled through the issuance of 1,119,316 common shares of the Company valued at $291,021. Current year financing fees include transaction fees on two loans obtained during the year.

Gain on settlement of debt

Gain on settlement of debt for the year ended June 30, 2019 was $14,250 (2018 ï loss of $104,478) and is a result of a difference in the fair value of share prices used to settle accounts payable and finance costs accrued.

Operating Activities and Plans

Company Structure

After the successful acquisition of Astra, the Company has been divided into 3 complimentary business units based in Trail (Canada), Burnaby (Canada), and Gdansk (Poland);

1) Hardware research and development are based in Trail, BC where the Company is actively pursuing grants to complete specialty components that will help secure data services contracts with existing and new customers.
    - The Trail facility has the perfect production and lab space to test and produce products that are desperately needed in building IIoT and smart city infrastructure.
    - The geographic location also provides the Company with access to funding through several regional economic diversity organizations that provide grants for the work CARL does.
    - Adding hardware and telemetry solutions to the CompanyÕs product offering provides true end to end solutions for the CompanyÕs clients.

2) Data Science is based in Gdansk, Poland. Gdansk has a large pool of extremely well-educated engineers and statisticians who build and release the advanced features in the applications that the Company provides to its clients.
    - The group has successfully completed a key piece of infrastructure that will allow very advanced statistical modelling tools to be used not only in the applications that CARL produces, but these can also be consumed by customers through a web service. This allows the features to be used in other applications and allows the Company to charge for services on a transaction basis. Since this model does not include user interface development, it has a high profit margin.
    - Because artificial intelligence, machine learning and other statistical services are now separated from application development, The Gdansk group can operate without dependency on the Software as a Solution (ñ**SaaS”**) based application developers which decreases the time needed to get advanced features to market.

3) Application Development is based in the Burnaby head office. In Burnaby the Company has a talented group of software engineers who continue to improve and expand on its core SaaS based application, FlowWorks.
    - The application has been significantly upgraded to allow inclusion of governments or companies with extremely high volumes of data to be accommodated.
    - Nearly unlimited cloud-based scalability means there are no ceilings for the size and number of clients that the Company can target.
    - The CompanyÕs developers have ensured that the platform can accommodate all types of time series data from virtually any device or data source. From images to stream flow to slope stability, FlowWorks can handle all of it.
    - The updates allow the Company to pursue a variety of clients from different industry verticals.

Moving Forward

CARL is actively targeting clients in many industrial market verticals. As IIoT explodes with new devices producing data, CARL is ready to be the go-to platform for data storage and analysis. The Company anticipates enormous growth in the ñSmart Citiesò market, with aging infrastructure, cities, mines, and utilities are scrambling to get a better idea of where upgrades and improvements are required. CARLôs platform provides answers in real-time to decision makers who need to make decisions on capital projects. The Companyôs predictive analytics features can help identify events that may significantly impact valuable assets. By including hardware into the product mix, CARL is ready to deliver cost effective end-to-end solutions to a massive emerging market.

Liquidity and Capital Resources

During the year ended June 30, 2019 the Companyôs operating activities required $925,413 (2018 ï $4,288,929) in cash stemming primarily from the net loss for the period and have decreased from the comparable period as the prior year required cash for a large investor relations program that commenced in November 2017.

The Companyôs cash as at June 30, 2019 was $30,829 (2018 - $247,795) and the Companyôs working capital deficiency was $1,614,781 (2018 ï working capital of $146,199).

Financing Activities

During the year ended June 30, 2019, the Company generated $716,687 from financing activities (2018 - $4,739,230). A total of $970,000 was generated through the short term loans (2018 ï $609,140), $430,000 from the issuance of convertible notes (2018 - $nil), and $20,037 in proceeds from the sale of digital currencies (2018 - $nil), less $616,064 (2018 ï $394,060) incurred in repayment of loans and $87,286 (2018 - $nil) on the repurchase of common shares. During the comparative period, the Company generated $4,999,150 in proceeds from share issuances and stock option exercises.

Investing Activities

During the year ended June 30, 2019, the Companyôs investing activities required $8,537 (2018 - $249,831) related to the acquisition of property and equipment ($250,000). During the comparative period, the Company generated $109 from the acquisition of a subsidiary.

Capital Structure

As at the date of this MD&A, the Company has 81,660,734 common shares, 22,250,404 warrants, and 8,918,886 stock options outstanding.

Financial Instruments and Risk Management

Fair value of financial instruments

The Company measures the fair value of its financial instruments according to a fair value hierarchy based on the significance of observable inputs used to value the instrument as follows:

- Level 1 ï Quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access at the measurement date.
- Level 2 ï Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.
- Level 3 ï Unobservable inputs for the asset or liability.

The Companyôs financial instruments consist of accounts and other receivables, accounts payable and accrued liabilities, loans payable, and convertible note and are classified as amortized cost. The carrying values of these financial instruments approximate their fair values because of their nature and/or relatively short maturity dates or durations.

Cash is classified as being at fair value through profit or loss. The fair value of cash is measured in accordance with Level 1 of the fair value hierarchy.

Financial and capital risk management

The Company examines the various financial instruments and risks to which it is exposed and assesses the impact and likelihood of those risks. These risks include market risk, foreign currency risk, interest rate risk, credit risk, and liquidity risk. These risks are reviewed and monitored by the Board of Directors.

The Board of Directors has overall responsibility for the determination of the Companyǿs risk management objectives and policies. The overall objective of the Board is to set policies that seek to reduce risk as far as possible without unduly affecting the Companyǿs competitiveness and flexibility. Discussions of risks associated with financial assets and liabilities are detailed below:

Market Risk

Market risk is the risk that changes in market prices, such as foreign exchange rates, interest rates and equity prices will affect the fair value or future cash flows of a financial instrument. The objective of market risk management is to manage and control market risk exposures within acceptable parameters, while optimizing the return. At June 30, 2019 and June 30, 2018, the Company was not subject to significant market risk, except as noted below.

Foreign currency risk

As at June 30, 2019 the Canadian dollar equivalent carrying values of the financial assets and liabilities denominated in foreign balances are as follows:

	US Dollars		**Polish Zloty**	
	2019	**2018**	**2019**	**2018**
Financial Assets				
Cash	$ 2,900	$ 43,443	$ 20,919	$ 65,854
Accounts receivable	245,102	178,883	-	-
Financial Liabilities				
Accounts payable and accrued liabilities	$ 107,141	$ 87,806	$ 27,994	$ 51,772

The Companyǿs subsidiary, FlowWorks, operates in the United States which, from the perspective of the Company, creates currency risk associated with those operations. FlowWorks has revenue of $1,125,520 (2018 - $1,111,681) (Canadian dollar equivalent). A 10% change in the foreign exchange rate would result in a $112,000 (2018 - $111,000) (Canadian dollar equivalent) change in profit or loss.

Interest Rate Risk

Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates. The Companyǿs interest rate risk mainly arises from changes in the interest rates on cash. Cash generates interest based on market interest rates. At June 30, 2019 and June 30, 2018, the Company was subject to interest rate risk with respect to its loans payable, some of which bear interest at a fixed rate and others are non-interest bearing, and convertible notes, which bear interest at a fixed rate.

Credit Risk

Credit risk arises from the non-performance by counterparties of contractual financial obligations. The Companyǿs maximum exposure to credit risk at the reporting date is the carrying value of cash and accounts and other receivables. The Company holds cash at a major Canadian chartered bank in a chequing account, a Washington State, USA bank, and a Polish bank.

The Company is exposed to credit risk on its trade accounts receivable. The Companyǿs credit risk for accounts receivable is concentrated as 41% of its trades account receivable is owing from four customers (2018 ï 43% from three customers), with more than 10% owing from two of those customers (2018 ï one).

The Company applies the simplified approach to providing for expected credit losses prescribed by IFRS 9, which permits the use of the lifetime expected loss provision for all trade receivables. To measure the expected credit losses, trade receivables are assessed primarily based on days past due. The Company has assessed expected credit losses based on 20% of its trade accounts receivables aged past 90 days and has estimated expected credit losses at June 30, 2019 of $2,759 (2018 - $22,373).

Liquidity Risk

Liquidity risk is the risk that an entity will encounter difficulty in meeting obligations associated with financial liabilities that are settled by delivering cash or another financial asset. The Company manages liquidity risk by maintaining adequate cash balances. If necessary, the Company may raise funds through the issuance of debt, equity or sale of non-core assets. The Company ensures that there is sufficient capital to meet its obligations by continuously monitoring and reviewing actual and forecasted cash flows and matching the maturity profile of financial assets to development, capital and operating needs. The Companyös accounts payable are due within 30 to 60 days. The Company has limited working capital at June 30, 2019 and will need to raise further financing to meet its financial obligations.

Off-Balance Sheet Arrangements

The Company has no off-balance sheet arrangements.

Related Party Transactions

The Company has entered into an executive consulting agreement with a company controlled by the President, CEO and director of the Company. Under the terms of the agreement, the Company will pay the company a total of $11,667 per month.

During the year ended June 30, 2019, the Company paid or accrued, to key management personnel and their related companies:

	Consulting Fees	Share-based payments	Total
Chief Executive Officer	$ 140,000	$ 67,106	$ 207,106
Chief Financial Officer	25,000	-	25,000
Former Chief Financial Officer	108,000	6,645	114,645
Non-executive Directors	50,000	73,922	123,922
Total	$ 323,000	$ 147,673	$ 470,673

During the year ended June 30, 2018, the Company paid or accrued, to key management personnel and their related companies:

	Consulting Fees	Share-based payments	Total
Chief Executive Officer	$ 134,166	$ 80,614	$ 214,780
Former Chief Financial Officer	108,000	10,983	118,983
Non-executive Directors	81,500	69,317	150,817
Total	$ 323,666	$ 160,914	$ 484,580

Included in accounts payable and accrued liabilities is $241,805 (2018 - $70,529) due to officers, directors, and a former officer of the Company. During the year ended June 30, 2019, the Company issued a total of 540,000 (2018 ï 305,768) common shares to related parties to settle accounts payable and accrued liabilities of $64,500 (2018 - $79,500).

On June 9, 2014, ETS signed a referral services agreement with RA Revenue Automation Inc. (ñRAò) whereby RA agreed to use ETS as its exclusive referral marketing application and include the concept in all relevant business development pitches to customers. A company controlled by the Companyös CEO owns 10% of RA. Revenue of $96,600 (2018 - $96,600) recorded on the consolidated statement of comprehensive loss is from RA. As at June 30, 2019, $33,810 (2018 - $42,263) was owed from RA.

Kerr Wood Leidal Associates Ltd. ("KWL")

KWL, a consulting engineering company, founded and created FlowWorks and is related through a director of the Company. During the year ended June 30, 2019, the Company earned sales revenue from KWL of $142,775 (2018 ï $170,210) and incurred expenses from KWL of $30,101 (2018 ï $16,061). Included in accounts receivable as at June 30, 2019 is a balance owing from KWL of $30,030 (2018 - $88,862).

Proposed Transactions

The Company has entered into an agreement (the ñ**i4C Agreement**ò) to acquire 100% of the outstanding shares of i4C Innovation Centre Inc. (ñ**i4C**ò), a technology integration and collaboration company that holds the lease for the data center and sensor manufacturing facility for IIOT devices that Astra occupies in Trail, BC (see above). This acquisition could allow the

Company to have a more direct relationship with the Columbia Basin Trust which is the holder of the lease for the Trail, BC facility and also facilitates the supply of electricity at a reduced rate. The i4C Agreement calls for Carl to issue 500,000 common shares to the sole shareholder of i4C and to issue 210,000 common shares to an individual in settlement of a debt of $10,000 owing by Astra and $32,000 owing by i4C. If this transaction has not closed through the contemplated issuance of shares before October 31, 2019, the i4C Agreement with terminate.

Subsequent Events

Subsequent to June 30, 2019, the Company:

a) repurchased and returned to treasury 36,888 common shares at a price of US$0.225 per share pursuant to a settlement agreement entered with the former dissenting shareholder;

b) received a loan of $30,000 from an armøs-length party with maturity of December 31, 2019 bearing interest at a rate of 15% per annum;

c) issued 1,000,000 in common shares to an armøs length party to settle accounts payable and accrued liabilities of $100,000;

d) completed a private placement whereby it issued a total of 4,000,000 common share units (each, a õUnitö) at a price of $0.20 per Unit for gross proceeds of $800,000. Each Unit consisted of one common share and one half of one common share purchase warrant with each whole warrant entitling its holder to purchase one additional common share for a period of two years at a price of $0.50 per common share. In connection with the offering, the Company paid a finderøs fee of $64,000;

e) received subscriptions for an aggregate of $300,000 in convertible notes. The notes will have a maturity of one year from issuance, bear interest at 12% and be convertible at $0.30. As at the date of this report, the transaction has not closed and the notes have not been issued;

f) entered into the i4C Agreement to acquire 100% of the outstanding shares of i4C. The i4C Agreement calls for Carl to issue 500,000 common shares to the sole shareholder of i4C and issue 210,000 common shares to an individual in settlement of a debt of $10,000 owing by Astra and $32,000 owing by i4C. If this transaction has not closed through the contemplated issuance of shares before October 31, 2019, the i4C Agreement will terminate; and

g) repurchased and returned to treasury another 36,888 common shares at a price of US$0.225 per share pursuant to a settlement agreement entered with the former dissenting shareholder.

Critical Accounting Estimates

The effect of a change in an accounting estimate is recognized prospectively by including it in profit or loss in the year of the change, if the change affects that year only, or in the year of the change and future years, if the change affects both.

Valuation of acquired assets

The Company has made estimates with respect to the acquisition date fair values of the identifiable assets and liabilities of FlowWorks, Astra, Carl PL, and AB Embedded. The valuation of intangible assets requires management to use valuation techniques to assess the fair values of assets and liabilities acquired at acquisition date. The Company used its judgment to select methods and makes assumptions that reflected market conditions as at the acquisition dates.

Income tax

The determination of income tax is inherently complex and requires making certain estimates and assumptions about future events. While income tax filings are subject to audits and reassessments, the Company has adequately provided for all income tax obligations. However, changes in facts and circumstances as a result of income tax audits, reassessments, jurisprudence and any new legislation may result in an increase or decrease in the Companyøs provision for income taxes.

Equity-settled transactions

The Company measures the cost of equity-settled transactions with employees by reference to the fair value of the equity instruments at the date at which they are granted. Equity-settled transactions with non-employees are recorded at the fair value of the service provided, where this is readily determinable. In other instances, they are recorded at the fair value of the equity instruments issued. Estimating fair value for share-based payment transactions requires determining the most appropriate valuation model, which is dependent on the terms and conditions of the grant. This estimate also requires determining the most appropriate inputs to the valuation model including the expected life of the share-based award, volatility and dividend yield and making assumptions about them.

New standards and interpretations adopted

IFRS 9 Financial Instruments

IFRS 9 sets out requirements for recognizing and measuring financial assets, financial liabilities and some contracts to buy or sell non-financial items. This standard replaces IAS 39 Financial Instruments: Recognition and Measurement (ñIAS 39ò).

The Company has adopted IFRS 9 retrospectively as of July 1, 2018. Changes in accounting policies resulting from the adoption of IFRS 9 do not have a material impact on the Companyõs consolidated financial statements.

The Companyõs financial assets previously carried as loans and receivables are now classified as amortized cost without material impact to carrying values.

The Company has determined that the application of IFRS 9õs impairment requirements as at July 1, 2018 does not result in any additional impairment allowances.

IFRS 15 Revenue from Contractors with Customers

IFRS 15 was issued with the intent of significantly enhancing consistency and comparability of revenue recognition practices across entities and industries. IFRS 15 replaces IAS 18 Revenue, IAS 11 Construction Contracts and related interpretation. The new standard establishes a single, principles-based five-step model to be applied to all contracts with customers and introduces new and enhanced disclosure requirements.

The Company has adopted the modified retrospective approach which allows the cumulative impact of the adoption to be recognized in retained earnings as of July 1, 2018 and that the comparative figures will not be restated. Changes in accounting policies resulting from the adoption of IFRS 15 did not have a material impact on the Companyõs consolidated financial statements.

Future Changes in Accounting Policies

IFRS 16 Leases

IFRS 16 replaces IAS 17 ï Leases and requires lessees to account for leases on the statement of financial position by recognizing a right to use asset and lease liability. The standard is effective for annual reports beginning on or after January 1, 2019, with earlier adoption permitted. The Company will be adopting IFRS 16 on July 1, 2019 using the modified retrospective approach and will not restate comparative amounts for the year prior to first adoption. For all leases, the lease liability will be measured at July 1, 2019 as the present value of any future minimum lease payments discounted using the appropriate incremental borrowing rate. The associated right of use assets will be measured at the amount equal to the lease liability on July 1, 2019.

There are no other IFRSs or IFRIC interpretations that are not yet effective that would be expected to have a material impact on the Company.

Risk Factors

The following are major risk factors management has identified which relate to the Companyõs business activities. Such risk factors could materially affect the Company's future financial results and could cause events to differ materially from those described in forward-looking statements relating to the Company. Though the following are major risk factors identified by management, they do not comprise a definitive list of all risk factors related to the Company's business and operations. Other specific risk factors are discussed elsewhere in this MD&A.

Capitalization and Commercial Viability

The Company will require additional funds to continue operations. The Company has limited financial resources, and there is no assurance that additional funding will be available to the Company to carry out the completion of all proposed activities. There can be no assurance that the Company will be able to obtain adequate financing in the future or that the terms of such financing will be favourable. Failure to obtain such additional financing could result in the curtailment of operations, liquidation of assets, seeking of additional capital on less favourable terms and/or other remedial measures.

History of Operating Losses

The Company has an accumulated deficit since its incorporation through June 30, 2019 of $17,058,207. The deficit may increase in the near term, as the Company continues its product development and establishes sales channels for its new products.

General Economic Conditions

The Company currently operates in Canada, the United States, and Poland and, like all global businesses, it has been subject to the impact of the current global credit and financial crisis on consumers in its areas of operations and the discretionary spending available to them. General economic conditions have resulted in reduced consumer and government spending and have impacted the Companyǿs profitability. Should these conditions continue to prevail, there will be further pressure on the Companyǿs profitability.

Key Employees

The success of the Company, like all marketing and software companies, is largely dependent on the performance of its key employees and directors. The failure to retain key employees and directors and to attract and retain additional key employees with necessary skills could have a material adverse impact upon the Company's growth and profitability. Competition for highly skilled management, technical and other employees is intense. There can be no assurance that the Company will be successful in attracting and retaining such personnel and the departure of any of the members of the Company's executive team or key directors could have a material adverse effect on the Company's business, results of operations and financial condition.

New Market Risk

The Company is operating in a large market but is providing a previously unavailable service. The Company faces uncertainty as to the degree of new and continuing market acceptance of its products. The performance of the Company also depends on the performance on agencies that the Company partners with along with their end customers.

Customer Risks

The Company is dependent on proper pricing of products, reporting of successful results of referral campaigns and timely collection of customer accounts. The Company is also dependent on its ability to ensure that their customers operate within the terms of its service agreements.

Intellectual Property Risks

The Company has taken steps to protect its proprietary technology. The Company relies on a combination of trademark, trade secrets, laws and other intellectual property protection methods to protect its proprietary technology. These steps may not completely protect the Companyǿs proprietary technology, nor give it a competitive edge. Others may independently develop substantially equivalent technology or gain access to our trade secrets. If the Company is unable to protect its intellectual property, the business over time could be materially affected. The Company will pursue all avenues available to it, if necessary, to enforce its patents, and to protect its trademarks and other intellectual property rights owned by the Company.

Reliance on Information Systems and Technology

The Companyǿs business relies upon information technology systems to service customers at the point of sale. Its information technology systems may be vulnerable to unauthorized access, computer viruses, system failures, other malicious acts or acts of nature. Should a significant disruption to its information technology occur, the Companyǿs earnings could be adversely affected through loss of revenue and the costs to rectify the disruption. The Company is in an industry with many competitors that lay claim to intellectual property. The Company may receive notice from a third party asserting the Company has infringed on their intellectual property rights. As a result of such claims the Companyǿs earnings could be adversely affected by costly litigation, product injunctions or consumption of management attention. The Company may also be required to expend significant capital and resources to protect against the threat of security, encryption and authentication technology breaches or to alleviate problems caused by such breaches.

Reliance on Third Party Licenses

The Company relies on certain software that it licenses from third parties, including a software program that is integrated with internally developed software and used in the Companyõs products to perform key functions. There can be no assurance that these third-party licenses will continue to be available to the Company on commercially reasonable terms. The loss of, or inability to maintain, any of these licenses, could result in delays or reductions in product and service deployment until equivalent software can be developed, identified, licensed and integrated, which could materially adversely affect the Company's business, results of operations and financial condition.

Risk Associated with International Operations

Management of the Company believes that its continued growth and profitability will require expansion of its sales further in the United States and into other foreign markets. This expansion will require significant management attention and financial resources and could adversely affect the Company's operating margins. In order to increase international sales in subsequent periods, the Company may establish additional foreign operations, incur substantial infrastructure costs, hire additional personnel and recruit international resellers. To the extent that the Company is unable to expand international sales in a timely and cost-effective manner, the Company's business, results of operations and financial condition could be materially adversely affected. In addition, even with the possible recruitment of additional personnel and international partners, there can be no assurance that the Company will be successful in maintaining or increasing international market demand for the Company's applications and services. The risk associated with currency fluctuations are comprised mainly of the Companyõs United States denominated sales, component purchases and other expenses. In the future, it is expected that a portion of revenues may be realized in other foreign currencies as a result of international sales. Fluctuations in the exchange rate between the Canadian dollar and other currencies, particularly the United States dollar, may have a material adverse effect on the Company's results of operations, financial condition and any business prospects. The Company may use hedges to mitigate the risk of foreign currency exposure.

Expansion

The success of the Companyõs continued expansion will depend upon many factors, including the ability of the Company to maintain acceptable attrition rates and control of operating costs. There can be no assurance that the Company will be able to grow or achieve its continued expansion. Such risks, if they materialize, could have a material adverse effect on the Companyõs business, financial condition, liquidity and results of operations.

Available Workforce

The Companyõs continued success will depend on the performance and continued service of the Companyõs employees. The Company relies on the ability to attract new software engineers and developers, research and development staff, production personnel and key sales and marketing employees. The Company will continue to develop our employees and search for key new hires, however there is no assurance that the Company will be able to retain existing personnel or attract, hire and retain additional qualified personnel.