



**CARL DATA SOLUTIONS INC.**

**MANAGEMENT'S DISCUSSION & ANALYSIS  
FOR THE THREE AND SIX MONTHS ENDED DECEMBER 31, 2018**

## General

This Management's Discussion and Analysis ("MD&A") of CARL Data Solutions Inc. ("CARL," or the "Company") is dated March 1, 2019 and provides a review of the Company's financial results, from the viewpoint of management, for the three and six months ended December 31, 2018 ("2019-Q2") compared to the three and six months ended December 31, 2017 ("2018-Q2").

The following information should be read in conjunction with the Company's audited consolidated financial statements with accompanying notes for the fiscal year ended June 30, 2018 ("2018"), which were prepared in accordance with International Financial Reporting Standards ("IFRS").

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](http://www.sedar.com).

## Cautionary Statement Regarding Forward-Looking Statements

Certain statements contained in this document constitute "forward-looking statements". When used in this document, the words "may", "would", "could", "will", "intend", "plan", "propose", "anticipate" and "believe", are intended to identify forward-looking statements. Such statements reflect the Company's "forecast", "estimate", "expectation" and similar expressions as they relate to the Company's 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 Company's 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. ("CARL" or the "Company") was incorporated under the Business Corporations Act (British Columbia) on January 17, 2014. CARL is a developer of Big-Data-as-a-Service ("BDaaS")-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 ("CSE") (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 ó 1090 West Georgia Street, Vancouver, British Columbia, V6E 3V7. The Company's consolidated financial statements include the financial statements of the following subsidiaries:

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

CARL has spent the past year identifying, closing and integrating the two acquisitions, FlowWorks and Astra Global into the core business. 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 ("IIoT") space as required for smart cities.

The combined capabilities of the business 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 CARL's 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 Company's 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 Company's 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 December 31, 2018, the Company had not achieved profitable operations, had accumulated a deficit of \$15,427,457 since inception and expects to incur further operating losses in the development of its business. The Company's 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 Company's ability to continue as a going concern.

### **Recent Events & Overall Performance**

#### ***Completed Private Placements and share issuances***

During and subsequent to the period ended December 31, 2018, 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 recognized as a decrease to share capital of \$54,010.
- (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 settled accounts payable with a director of \$33,000. The Company recognized a loss of \$1,650 on the settlement to the loss for the period.
- (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 to the loss for the period.
- (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 recognized as a decrease to share capital of \$11,143.
- (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, 2022, the Company issued 210,000 common shares at a deemed price of \$0.15 per common share to a director of the Company in settlement of \$31,500 of accounts payable.

***Acquisition of Astra***

On June 18, 2018, the Company completed its 100% acquisition of Astra, by issuing 9,300,000 common shares of the Company, valued at \$1,348,500, to the former shareholders of Astra. This acquisition is consistent with the Company's corporate growth strategy to build and acquire applications that assist in the collection, storage and analysis of large volumes of information for data centric companies. Astra is a technology company with multiple potential revenue streams including data center hosting, big data analytical services, and the manufacture of Industrial Internet of Things devices.

***Short-Term Loans***

During the period ended December 31, 2018, the Company entered into the following loan agreements:

- a) \$300,000 from an arm's-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 period ended December 31, 2018 through the issuance of a convertible note in the same amount. As at December 31, 2018, interest payable of \$41,695 remains included in the balance of loans payable;
- b) \$100,000 from an arm's-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. If not repaid by January 26, 2019, interest of 13% per annum will accrue on the principal amount of \$100,000. As at December 31, 2018 the \$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 arm's-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. As at December 31, 2018, \$1,627 in interest has been included in the balance of loans payable relating to these loans; and
- e) \$225,000 from an arm's-length party bearing interest of 2.5% + prime on a monthly basis. After 24 months, the Company will make monthly payments over 60 months inclusive of principal and interest components. As at December 31, 2018 \$1,153 in interest remains included in the balance of loans payable.

***Convertible notes***

During and subsequent to the period ended December 31, 2018, 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; and
- c) \$130,000 in two convertible notes issued on January 29, 2019, bearing interest at a rate of 10% per annum and maturing on July 29, 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. The Company allocated \$41,539 to the equity component of the note.

***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 and subsequent to the period ended December 31, 2018, the Company had the following stock option issuances:

- (i) On September 14, 2018, the Company cancelled the following options:
  - (i) 919,600 expiring January 12, 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 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.

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**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:

	<b>December 31, 2018</b>	<b>September 30, 2018</b>	<b>June 30, 2018</b>	<b>March 31, 2018</b>
Revenue	\$ 450,220	\$ 466,462	\$ 365,499	\$ 280,808
Operating expenses	1,247,536	1,364,275	1,393,741	981,772
Loss for the period	(808,207)	(929,643)	(630,573)	(697,639)
Basic and Diluted Loss per share	(0.01)	(0.01)	(0.01)	(0.01)
Assets	3,755,001	3,786,595	4,385,604	2,925,440
Liabilities	1,708,767	1,285,729	987,015	798,921
Shareholder Equity	2,046,234	2,500,866	3,398,589	2,126,519

  

	<b>December 31, 2017</b>	<b>September 30, 2017</b>	<b>June 30, 2017</b>	<b>March 31, 2017</b>
Revenue	\$ 250,076	\$ 362,529	\$ 379,370	\$ 239,397
Operating expenses	2,418,821	1,239,247	1,642,587	1,100,086
Loss for the period	(2,173,793)	(1,272,664)	(1,293,221)	(830,689)
Basic and Diluted Loss per share	(0.04)	(0.03)	(0.03)	(0.02)
Assets	1,681,410	1,435,275	1,423,721	1,738,034
Liabilities	1,898,047	1,125,277	1,645,625	1,317,128
Shareholder Equity (Deficiency)	(216,637)	309,998	(221,904)	420,906

**Discussion of Second Quarter Operations**

**Revenue**

For the six-month period ended December 31, 2018, the Company generated \$916,682 in revenues (2017 - \$612,605) of which \$509,019 (2017 - \$564,305) related to revenue generated by FlowWorks, \$48,300 (2017 - \$48,300) related to revenue generated by ETS and \$351,580 related to revenue generated by Astra (2017 - \$nil). 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 six-month period ended December 31, 2018 was \$397,622 (2017 ó \$132,364). 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 six-month period ended December 31, 2018 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 Company's 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 six-month period ended December 31, 2018 were \$175,741 (2017 ó \$134,278). The additional hosting costs were incurred as a result of running the Company's new platform in tandem with its former and management does not expect these to persist in the future.

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*Consulting fees*

Consulting fees for the six-month period ended December 31, 2018 were \$576,475 (2017 ó \$493,696). Consulting fees are primarily used for contracts with developers and for management and movement between the two periods is considered reasonable. During the six-month period ended December 31, 2018, the Company recognized \$80,789 for shares issued on one-year anniversary of the AB Embedded business combination, which explains a significant portion of the change.

*Depreciation*

Depreciation for the six-month period ended December 31, 2018 was \$107,712 (2017 ó \$nil). 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 six-month period ended December 31, 2018 were \$181,561 (2017 - \$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 six-month period ended December 31, 2018 were \$58,586 (2017 ó \$51,311) which are considered comparable between the two periods.

*Investor Relations*

Investor relations expense for the six-month period ended December 31, 2018 was \$72,763 (2017 ó \$1,848,351). 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 six-month period ended December 31, 2018 were \$97,987 (2017 ó \$81,944). The Company experienced significant growth during the year ended June 30, 2018 with the business combinations of AB Embedded, Carl PL, and Astra, and therefore an increase in office and miscellaneous costs is expected.

*Professional fees*

Professional fees for the six-month period ended December 31, 2018 were \$137,749 (2017 ó \$135,944). 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 six-month period ended December 31, 2018 were \$208,611 (2017 ó \$81,842). The expense relates primarily to stock options granted and vested during the period and are not expected to be comparable over the two periods as the expense is dependent on the timing of grants and vesting schedules.

*Salaries and wages*

Salaries and wages for the six-month period ended December 31, 2018 were \$383,035 (2017 ó \$445,847). 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 six-month period ended December 31, 2018 were \$58,442 (2017 ó \$81,749). The decrease in travel is a result of management initiatives to reduce overall expenditure to conserve working capital.

### *Financing Costs*

Financing costs for the six-month period ended December 31, 2018 were \$45,000 (2017 ó \$292,028). Financing costs in the comparable period related exclusively to royalties paid and fully satisfied on the Company's convertible debenture, which was primarily settled through the issuance of 1,119,316 common shares of the Company valued at \$291,022. Current period financing fees include transaction fees on two loans obtained during the period.

### *Gain on settlement of debt*

Gain on settlement of debt for the six-month period ended December 31, 2018 was \$5,850 (2017 ó loss of \$103,918) 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 Smart System, the Company has been divided into 3 complimentary business units based in Trail (Canada), Burnaby (Canada), and Gdansk (Poland);

- 1) Hardware R&D 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.
  - o 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.
  - o 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.
  - o Adding hardware and telemetry solutions to the Company's product offering provides true end to end solutions for the Company's 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.
  - o 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 allow the Company to charge for service on a transaction basis. Since this model does not include user interface (UI) development, it is extremely profitable.
  - o Because AI/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 (óSaaS") 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 work on its core SaaS based application, FlowWorks.
  - o The application has been significantly upgraded to allow inclusion of governments/companies with extremely high volumes of data to be accommodated.
  - o Nearly unlimited cloud-based scalability means there are no ceilings for the size and number of clients that the Company targets.
  - o The Company's 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.
  - o 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 óSmart Cities" area, with aging infrastructure, cities, mines, and utilities are scrambling to get a better idea of where upgrades and improvements are required. CARL's platform provides answers in real time to decision makers who need to make decisions on capital projects. The Company's 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 six months ended December 31, 2018 the Company's operating activities required \$361,368 (2017 ó \$2,634,313) in cash stemming primarily 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 Company's cash as at December 31, 2018 was \$295,631 (June 30, 2018 - \$247,795) and the Company's working capital deficiency was \$493,547 (June 30, 2018 ó working capital of \$482,498).

### ***Financing Activities***

During the six months ended December 30, 2018, the Company generated \$407,675 from financing activities (2017 - \$2,664,136). A total of \$765,000 was generated through the short term loans (2017 ó 609,140), \$300,000 from the issuance of convertible notes (2017 - \$nil), and \$7,828 in proceeds from the sale of digital currencies, less \$600,000 (2017 ó \$42,000) incurred in repayment of loans and \$65,153 (2017 - \$nil) on the repurchase of common shares. During the comparative period, the Company generated \$2,096,996 in proceeds from share issuances and stock option exercises.

### ***Investing Activities***

The Company did not expend cash on investing activities during the six-month periods ended December 31, 2018 or 2017.

### **Capital Structure**

As at the date of this MD&A, the Company has 76,771,398 common shares, 26,200,834 warrants, and 8,943,886 stock options outstanding.

### **Financial Instruments and Risk Management**

#### ***Fair value of financial instruments***

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

The Company's financial instruments consist of cash, 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.

#### ***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 Company's 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 Company's competitiveness and flexibility. Discussions of risks associated with financial assets and liabilities are detailed below:

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*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 December 31, 2018 and June 30, 2018, the Company was not subject to significant market risk, except as noted below.

*Foreign currency risk*

As at December 30, 2018 the Canadian dollar equivalent carrying values of the financial assets and liabilities denominated in foreign balances are as follows:

	US Dollars		Polish Zloty	
	2018	2017	2018	2017
<b>Financial Assets</b>				
Cash	\$ 5,097	\$ 8,153	\$ 112,491	\$ -
Accounts receivable	180,951	246,134	-	-
<b>Financial Liabilities</b>				
Accounts payable and accrued liabilities	\$ 101,734	\$ 119,901	\$ 16,688	\$ -

The Company's 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 \$509,019 (2017 - \$564,305) (Canadian dollar equivalent). A 10% change in the foreign exchange rate would result in a \$51,000 (2017 - \$56,000) (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 Company's interest rate risk mainly arises from changes in the interest rates on cash. Cash generates interest based on market interest rates. At December 30, 2018 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 note, which bears interest at a fixed rate.

*Credit Risk*

Credit risk arises from the non-performance by counterparties of contractual financial obligations. The Company's maximum exposure to credit risk at the reporting date is the carrying value of cash and accounts 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 Company's credit risk for accounts receivable is concentrated as 37% of its trades account receivable is owing from three customers (June 30, 2018 6 43% from three customers), with more than 10% owing from one of those customers.

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 December 31, 2018 of \$3,366 (June 30, 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 Company's accounts payable are due within 30 to 60 days. The Company has limited working capital at December 31, 2018 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 period ended December 31, 2018, the Company paid or accrued, to key management personnel and their related companies:

	Consulting Fees	Share-based payments	Total
Chief Executive Officer	\$ 70,000	\$ 47,876	\$ 117,876
Former Chief Financial Officer	54,000	4,722	58,722
Non-executive Directors	50,000	53,398	103,398
<b>Total</b>	<b>\$ 174,000</b>	<b>\$ 105,996</b>	<b>\$ 279,996</b>

During the period ended December 31, 2017, the Company paid or accrued, to key management personnel and their related companies:

	Consulting Fees	Share-based payments	Total
Chief Executive Officer	\$ 65,000	\$ 3,466	\$ 68,466
Former Chief Financial Officer	54,000	-	54,000
Non-executive Directors	49,000	15,770	64,770
<b>Total</b>	<b>\$ 168,000</b>	<b>\$ 19,236</b>	<b>\$ 187,236</b>

Included in accounts payable and accrued liabilities is \$187,530 (June 30, 2018 - \$70,529) due to officers, directors, and a former officer of the Company.

On June 9, 2014, ETS signed a referral services agreement with RA Revenue Automation Inc. (öRAö) 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 Company's CEO owns 10% of RA. Revenue of \$48,300 (2017 - \$48,300) recorded on the statement of comprehensive loss is from RA. As at December 31, 2018, \$25,358 (June 30, 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 period ended December 30, 2018, the Company earned sales revenue from KWL of \$58,525 (2017 - 55,800) and incurred expenses from KWL of \$15,854 (2017 ö 6,290). Included in accounts receivable as at December 31, 2018 is a balance owing from KWL of \$25,022 (June 30, 2018 - \$88,862).

**Proposed Transactions**

The Company has no specific proposed transactions.

**Subsequent Events**

Subsequent to December 31, 2018, the Company:

- a) entered into an agreement whereby it settled accounts receivable of \$32,922 in exchange for the receipt of 700 used cloud computing terminals that it can use for digital currency processing services;
- b) 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;

- c) issued two convertible notes totaling \$130,000 bearing interest at a rate of 10% per annum and maturing in six months. 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; and
- d) issued 210,000 common shares at a deemed price of \$0.15 per common share to a director of the Company in settlement of \$31,500 of accounts payable.

### **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 Company's 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 (IAS 39).

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 Company's consolidated financial statements.

*Classification and measurement of financial assets and financial liabilities*

IFRS 9 replaces the guidance in IAS 39, on the classification and measurement of financial assets. IFRS 9 eliminates the existing IAS 39 categories of held-to-maturity, available-for-sale and loans and receivable.

Financial assets will be classified into one of two categories on initial recognition:

- Financial assets measured at amortized cost; or
- Financial assets measured at fair value.

The classification of financial assets under IFRS 9 is generally based on the business model in which a financial asset is managed and its contractual cash flow characteristics. A financial asset (unless it is a trade receivable without a significant financing component that is initially measured at the transaction price) is initially measured at fair value plus, for an item not at fair value through profit or loss, transaction costs that are directly attributable to its acquisition. For financial assets measured at amortized cost, these assets are subsequently measured at amortized cost using the effective interest method. The amortized cost is reduced by impairment losses. Interest income, foreign exchange gains and losses and impairment are recognized in profit or loss. Any gain or loss on derecognition is recognized in profit or loss.

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

*Impairment of financial assets*

IFRS 9 replaces the incurred loss model in IAS 39 with an expected credit loss (ECL) model. Using the simplified approach for trade receivables, the Company will measure loss allowances for trade and other receivables at an amount equal to lifetime ECLs. ECLs are a probability-weighted estimate of credit losses.

Loss allowances for financial assets measured at amortized cost are deducted from the gross carrying amount of the assets. Impairment losses on trade and other receivables are presented as bad debts expense in the statement of loss and comprehensive loss, similar to the presentation under IAS 39.

The Company has determined that the application of IFRS 9's 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 do not have a material impact on the Company's consolidated financial statements.

*Revenue recognition*

The Company earns revenue from the provision of digital currency verification services and in its subsidiaries, FlowWorks, ETS, and Astra through the performance of services revenue and data center hosting.

*i. Services revenue*

Services revenue includes custom programming service contracts, data services through software subscription revenue, and the supply of social referral software to clients. Services revenue is measured at the fair value of the consideration received or receivable for services, net of discounts and sales taxes. Consideration received from customers in advance is recorded as deferred revenue. Services revenue is recognized as the Company satisfies its performance obligation over time.

*ii. Data center hosting*

Revenue from data center hosting at the fair value of the consideration received or receivable for services, net of discounts and sales taxes and is recognized as the Company satisfies its performance obligation over time.

*iii. Digital currency verification services*

The Company provides transaction verification services within digital currency networks, for which it receives digital currency from each specific network as consideration. Revenue is measured based on the fair value of the coins received. The fair value is determined using the closing spot price of the coin on the date of receipt, based on prices available on [www.cryptocompare.com](http://www.cryptocompare.com). The coins are recorded on the statement of financial position, as digital currencies, at their fair value and re-measured at each reporting date. Revaluation gains or losses, as well as gains or losses on the sale of coins for traditional (fiat) currencies are included in profit and loss in accordance with the Company's treatment of its digital currencies as a traded commodity.

There is currently no specific definitive guidance in IFRS or alternative accounting frameworks for the accounting for the mining and strategic selling of digital currencies and management has exercised significant judgment in determining the appropriate accounting treatment for the recognition of revenue for mining of digital currencies. Management has examined various factors surrounding the substance of the Company's operations, including the stage of completion being the completion and addition of a block to a blockchain and the reliability of the measurement of the digital currency received.

**Future Changes in Accounting Policies**

At the date of this MD&A, the IASB and IFRIC have issued the following new and revised standards, amendments and interpretations which are not yet effective during the period ended December 31, 2018:

*IFRS 16 Leases*

IFRS 16 replaces IAS 17 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 is currently evaluating the impact of the application of this standard.

**Risk Factors**

The following are major risk factors management has identified which relate to the Company's 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 December 31, 2018 of \$15,427,457. 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 Company's profitability. Should these conditions continue to prevail, there will be further pressure on the Company's 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 Company's 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 Company's 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 Company's 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 Company's 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 Company's 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 Company's 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 Company's 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 Company's business, financial condition, liquidity and results of operations.

*Available Workforce*

The Company's continued success will depend on the performance and continued service of the Company's 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.