



Data Governance Post-COVID Assessment

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Hi everyone, my name is Gordon and joining us we have Jeremy, Assel, Yumin, and Diego.
We are here to present our data governance strategy proposal for Brookfield Asset
Management.



The **Pegasus Data Governance Post-COVID Assessment** provides a portrait of Brookfield's current data governance sophistications and delivers guidance for a path to achieve strategic data management capabilities and goals



Our team, Pegasus Data Consultants will provide a post-COVID assessment that paints a portrait of Brookfield's current data governance sophistications and deliver guidance for a path to achieve strategic data management capabilities and goals.



Overview

- ▶ Brookfield Asset Management is an alternative asset management firm founded in 1899 with over \$500B in assets under management
- ▶ Purpose: to generate long-term value for clients and stakeholders through the form of risk-adjusted investments
- ▶ Vision: become a global leader in asset management through investments in long-life, high-quality assets and businesses that comprise the backbone of today's economy
- ▶ Over 150,000 employees
- ▶ Public company within the financial services industry
- ▶ Specialists: alternative assets (real estate, renewable power, infrastructure)

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First, let us go through an overview of the organization to gain a better understanding of who we are working with. Brookfield Asset Management is an alternative asset management firm founded in 1899 with over \$500 billion assets under management. The company's purpose is to generate long-term value for clients and stakeholders through the form of risk-adjusted investments. As for their vision, Brookfield strives to be a global leader in asset management through investments in long-life, high-quality assets and businesses that make up the backbone of today's economy. To get an idea of the size and position, they currently have over 150,000 employees. Brookfield is a publicly held company within the financial services industry. As for their specialties, their expertise is within alternative assets. These include investing in real estate, renewable power, and infrastructure rather than traditional assets such as bonds, equities, and cash.



Why Data Governance is Required

Asset management companies require a structured data management framework provided by implementing data governance

- ▶ Having a framework mitigates risks in managing data within the organization
- ▶ COVID-19 → massive surge of online data that requires management
- ▶ Better communication tools
- ▶ Digitization of services
- ▶ Information security

Brookfield's Four Core Values:



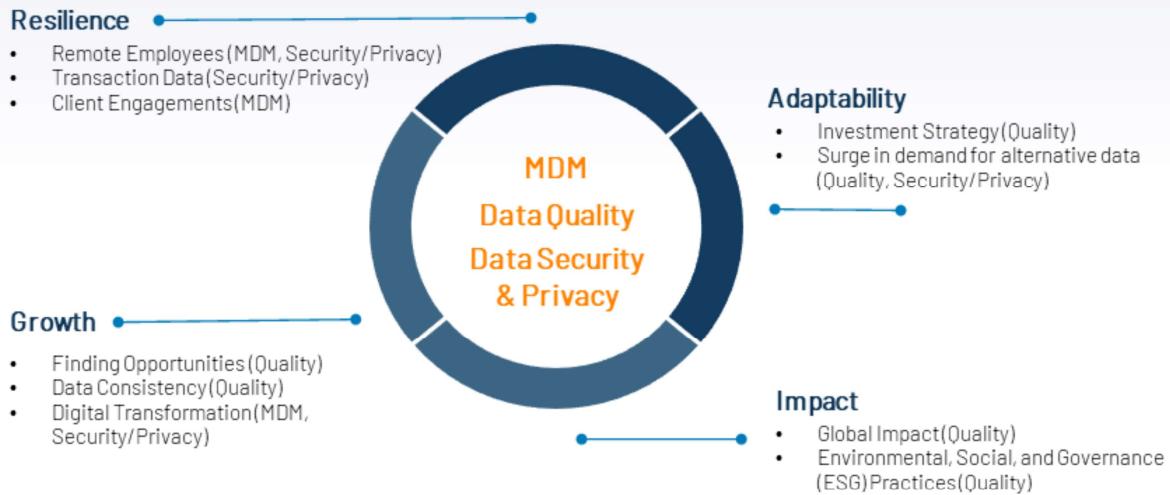
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Next, let us answer the question at hand. Why exactly does Brookfield require a data governance strategy? To answer that, we need to first understand that asset management companies generally require a structured data management framework provided by the implementation of data governance. This framework is used to mitigate many risks involved in managing data within the organization. More specifically, asset management firms are required to protect sensitive data such as financials and customer-related information. Due to the COVID-19 pandemic, there has been a massive surge of online data for firms to handle, thus leading to a need for better communication tools, digitization of services, and information security practices to meet the demands of customers. This is applicable to our data governance strategy as these challenges impact to Brookfield's four core business values. These values are resilience, adaptability, growth, and impact. Resilience and adaptability are labelled as Brookfield's operational rocks. These set of values make up the foundation that their investments strategies are based upon. Growth and impact on the other hand are their success metrics, providing them with an ultimate goal for each quarter. To maintain these 4 core values, Brookfield must mitigate unexpected risks that pose a threat to their data management practices by introducing a robust data governance strategy.

Now, I will hand it to Jeremy to further discuss our strategy to achieve this.



Addressing Problems & Needs



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Thank you Gordon

So what can we address?

Well let's start with **Resilience**. Brookfield's company value hinges around resilience. Rather than making great investments, what **really** matters is developing a business that is **resilient** enough to weather any storm.

SO! To help meet this need post-COVID, we will target areas like Remote Employees, Transaction Data, and Client Engagement. Right now, Brookfield has a business continuity plan that has employees working remotely for the foreseeable future. Computer sharing, unsecure networks, these can cause major unintentional cybersecurity headaches.

Now looking at Brookfields first quarter in 2020, COVID market volatility has actually led to an uptick in transactions as deals are being closed and shares being repurchased. Which means Brookfield will be handling more transaction data than ever...over remote networks. You see where I'm going with this.

And this also means more client engagement, so this is the chance to reassess the company's MDM, where outdated or low quality contact information can impact productivity. Think of something as simple but frustrating as an outdated phone number!

Our strategy aims to target the new emerging risks relating to a rapid acceleration of

client and employee engagements, to make sure Brookfield emerges from COVID more resilient than before.



Adaptability

MAIN USES OF ALTERNATIVE DATA



TOP 5 ALTERNATIVE DATA SETS USED BY "MARKET LEADERS"

From left to right the most used alternative data sets



Alternative Investment Management Association. (2020). Casting the Net: How Hedge Funds are Using Alternative Data. Accessed July 27, 2020. <https://www.aima.org/uploads/assets/221952e6-a2b6-494c-b11d58612424cfb/CastingTheNetUsingAlternativeData14052020.pdf>

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Adaptability. Brookfield's **investment strategy** is based on buying value. This means adaptability is crucial for accessing opportunities as markets change. COVID has forced the industry to depend on a number of future **evolving and unpredictable** developments. It's a neverending race to have timely and consistent data! To make things more complicated, alternative data, which for the most part is unstructured, is absolutely necessary to make accurate assumptions.

alternative data is the future for alternative asset management, market leaders are trailblazing to find new opportunities. This means Brookfield is looking at a future where investment strategies will rely on timely data that is rapidly changing, high in volume, and largely unstructured. This is where we come in. We plan on evaluating whether Brookfield is handling the acceleration in velocity, volume, and variety the best they can in a post-Covid environment, and if not we have plans to equip the company with strategies that will allow for adaptability with low-risk



Growth

- Finding Opportunities (Quality)
- Data Consistency (Quality)
- Digital Transformation (MDM/Security/Privacy)

Impact

- Global Impact (Quality)
- Environmental, Social, and Governance (ESG) Practices (Quality)

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Now let's look at growth and impact

We're looking at growth as the firm's capability to find new opportunities to deploy capital. As COVID has led to funds shifting asset classes, so new opportunities have to be found based on data collected across multiple industries. With how volatile the market is, we're gonna help make sure Brookfield has consistent, accurate data across all asset classes to guarantee quality decision making.

In addition, According to PWC, Digital transformation has been gathering pace, and the lockdown has sped things up by several years. growth ties hand in hand with a firm's digital capabilities for work. Our assessment will evaluate what digital capabilities Brookfield needs to improve on so that the company can move forward and grow in this new normal.

Lastly, Brookfield prides itself on making a global impact. COVID has not stopped this. The company has been and will be supporting many relief initiatives across the world. In addition, Brookfield has made a commitment to environmental, social, and governance (ESG) practices. We want to make sure Brookfield continues to be able to make an impact in a post-COVID environment.

That means analyses have to be able to identify and disclose any potential conflicts of interest, and the basis for that, is reliable data. Reliable alternative data. In other words, our reassessment will directly affect the level of global impact Brookfield can make. Successful strategies require putting alternative data to different uses by making sure

that both the right technology and the right talent is in place. Brookfield provides the talent, and we provide the strategies that make sure technology doesn't fail

Now I'll pass it over to my colleagues to detail how



Brookfield Asset Management

- ▶ 1000 financial professionals globally
- ▶ 150,000 operating employees
- ▶ 2,000 assets across 30 countries
- ▶ Large Scale Capital
- ▶ Operational Expertise
- ▶ Businesses in real estate, infrastructure, renewable energy, and private equity



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Thank you, Jeremy!

As Gordon mentioned earlier, Brookfield Asset Management (BAM) has over \$500B assets under management with presence across 30 countries and businesses in real estate, infrastructure, renewable energy, and private equity. Naturally, such large and diversified business requires strong leadership.



Leadership Structure

Board of Directors

Four Standing Committees:

Audit

Management Resources and Compensation

Governance and Nominating

Risk Management

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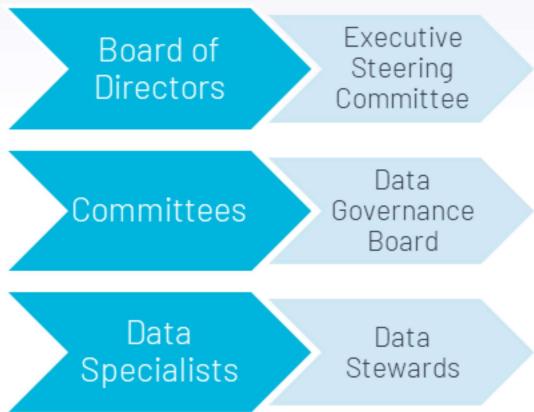
Our team of analysts performed preliminary research on Brookfield's organizational structure, its data related policies and procedures, including Data Protection Policy, Data Protection Program, and Enterprise Information Security Policy.

Brookfield is governed by:

Board of Directors, consisting of the CEO, officers and senior management, and four standing committees: Audit Committee, Management Resources and Compensation, Governance and Nominating Committee, and Risk Management Committee, which oversees cybersecurity risks, including assessing the likelihood, frequency and severity of cyber-attacks and data breaches, whether from internal or external sources, and reviewing management's cybersecurity practices in the context of the Corporation's risk profile.



Data Governance Organization Proposal



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To have a robust data governance program in place, we propose the Board of Directors to assume the responsibilities of the Executive Steering Committee. Further, the four standing committees are to form a Data Governance Board, which will appoint members of a Data Stewardship Council. This structure will ensure an optimal coordination within the organization to tackle the unexpected risks associated with the global pandemic, outlined by Jeremy.



Data Governance Challenges

- ▶ The varied and evolving nature of data protection **regulations** across geographies and countries
- ▶ Data locality in multiple **geographies**
- ▶ A **lack of centralized monitoring** for data privacy compliance and data governance

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Brookfield is a large company, operating across the globe; the industry is heavily regulated as well. All of these pose many additional risks and challenges: data protection regulations vary across countries; data located in multiple geographies; scarcity of centralized data governance monitoring.

In addition, to deliver flexible and high-quality customer-driven innovations, organizations have started adopting cloud and agile cultures. However, not all data can be quickly or easily moved to cloud. Therefore, there is a need to manage data on-premise, in the cloud, and in hybrid (on-premise + cloud) architectures.

Now, Yumin will walk you through the solutions our consultancy provides to help such an organization like Brookfield to manage data.



Technology

- ▶ Data quality
- ▶ Data security
- ▶ Data privacy
- ▶ Master Data Management
- ▶ Meta Data Management



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Next, we are going to talk about technologies that will help us in the data governance process. We focused on five aspects: they are Data quality, Data security, Data privacy , Master Data Management and Meta Data Management



Data Quality

- ▶ Proposed technology: MySQL

Features:

- Secure and reliable database management system(DBMS)
- Has automatic input data validation
- Data integration features



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Firstly, we consider the technology that will help to ensure data quality, as high data quality leads to better decision-making across our organization. The higher quality of the data we have, the better the investment decision will be made. Technology we considered to ensure data quality is to use the database management system, we proposed to use Mysql data server. It is ONE OF the most secure and reliable database management systemS. The automatic input data validation and data integration measurement will guarantee the quality of data stored in the database.



Data Security

- ▶ Proposed technology: Oracle Database Firewall

Oracle Database Firewall is an active, real-time database firewall solution that provides white-list, black-list and exception list policies, intelligent and accurate alerts, and monitoring with very low management and administrative costs.

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For the data security. Information about our business is mainly stored digitally. Many of these information are critical, like clients' account information. Any Data breach will cause inestimable loss to our company. We proposed to use oracle database firewall to protect our database, it will provide active, real-time protection to our system



Data Privacy

- ▶ Proposed technology: two-factor authentication

It is an authentication method in which the database access request is granted access only after successfully presenting two or more pieces of evidence to an authentication mechanism.

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Third is for data privacy, as Data in our company is stored in multiple geographies, which will cause A lack of centralized monitoring for data privacy. For internal data, it has been secured by a Database management system to control the access of data. For client's access to their own account, we plan to adopt the two-factor authentication to maximize the security and privacy of clients' information.



Meta Data Management

- ▶ Proposed technology: IBM InfoSphere Metadata Workbench

The technology provided by IBM enable users to explore relationships between information assets and metadata repository



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Fourth, we talk about technology related to Metadata Management. Enterprises must be able to turn their data into business assets in order to stay competitive. But since data comes in large volumes, varied formats and types, enterprises struggle to ensure that it can be used, shared and analyzed. This makes Metadata Management technology important. we Proposed to use IBM InfoSphere Metadata Workbench to solve the metadata management, this technology enable users to explore relationships between information assets and metadata repository



Master Data Management

- ▶ Proposed technology: informatica

It offers a modular, comprehensive MDM solution designed for flexibility. A complete view of all interactions and all the relationships between data from different sources are available.



It also leverages the power of AI and machine learning to ensure customers can locate, access, and utilize data when needed.

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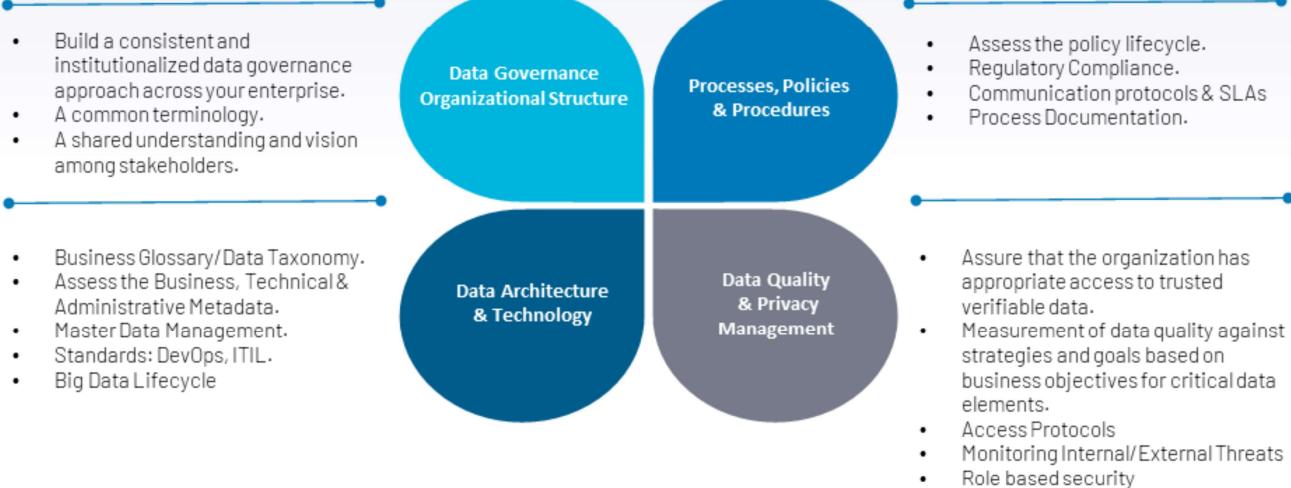
Finally, we introduced the technology for master data management, the technology we proposed is a master data management software called informatica, It offers a modular, comprehensive MDM solution designed for flexibility. A complete view of all interactions and all the relationships between data from different sources are available.

It also leverages the power of AI and machine learning to ensure customers can locate, access, and utilize data when needed. It is also capable of enriching master data according to the business rules of the investment, marketing and operational strategies of your company.

Next Diego will introduce us about Artifacts & assessment roadmap



Artifacts Post-COVID Assessment



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Diego: Thanks, Yumin. Now that we know the challenges we are going to face in the post-COVID era, as well as some of the strategic artifacts and the elements of a successful Data Governance strategy, we are going to see how the four-week version of our Post-COVID Assessment could benefit Brookfield by identifying the gaps that prevent it from meeting its data governance goals.

Our Post-COVID assessment focuses on four key artifacts. The first one, the Data Governance Organizational Structure, aims to build a consistent data governance approach across the company, assesses the Ownership, Roles, and Responsibilities, and standardizes the understanding and vision among stakeholders.

The second key artifact comprises the Processes, Policies, and Procedures. It evaluates the lifecycles, regulatory compliance, the communication protocols and Service Legal Agreements (SLAs), and process documentation.

The third one is Data Quality and Privacy Management, which assures that the organization possesses appropriate access to trusted verifiable data. It also involves the measurement of data quality against strategies and goals based on business objectives for critical data elements. Moreover, the Post-COVID Assessment validates the data classification, usage levels, as well as application levels, such as authentication, authorization, logging, and monitoring.

Finally, Data Architecture and Technology assesses the Master Metadata Management, and the standards involved in the Data Architecture and Technology management. Moreover, it evaluates the Big Data lifecycle and the consistency of the business glossary and data taxonomy.



Roadmap Post-COVID Assessment (one-month version)

	Week 1	Week 2	Week 3	Week 4
Data Gov Organizational	Data Management Ownership, Roles & Responsibilities			
Processes, Policies & Procedures		Data Governance Foundations Training		
Data Quality & Privacy Management	Standard Operating Procedures: Model Backup, Model Change Control & Model Creation and DB Population	Policies: Access/Usage/Integrity	Communication standards & SLAs	
Data Architecture & Technology	Government Model: Prevent - Detect - Investigate - Correct	Data Classification: Public/Internal/Confidential	Analytics & Usage Level: Masking/Access/Privacy	Application Level: Authentication/Authorization/Logging/Monitoring
	Big Data Life Cycle	Data Warehouse & Data Lakes	Master & Metadata Management tools	Standards

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Diego: Here we have the proposed four-week format for our Post-COVID Assessment. As you can see, it comprises the four artifacts with their key elements to be analyzed.

As for the Data Governance Organizational Structure, we will first understand the Brookfield's structure and then match Roles and Responsibilities in a Data Governance structure. We know the company needs a good understanding of the importance of Data Governance in an organization. So, we will offer during the assessment, several training sessions about the essentials of Data Governance.

Concerning Processes, Policies, and Procedures, we will focus on the Model Backup, Change Control, and Data Creation and Population. Moreover, we will evaluate Policies, particularly access, usage, and integrity. Furthermore, we need to understand Brookfield's communication protocols. For instance, Is WhatsApp an approved platform for communication? Lastly, the SLAs will also be evaluated in this stage.

We will spend three weeks on the government model in the Data Quality Assessment, two weeks for Data Classification, and two weeks validating Analytics and Usage. We will invest all four weeks analyzing the Application Levels to make sure privacy management is well implemented.

Lastly, The Data Architecture and Technology will be assessed with our experienced architects to determine potential improvements. The Big Data Lifecycle in the first three weeks, as well as Data Warehouse and Data Lakes in the first two weeks, Master and Metadata Management tools in the last two weeks. Finally, we will dedicate the last three weeks assessing the standards implemented in the company, such as DevOps, ITIL, among others.



Key benefits

The Post-COVID assessment identifies the steps your company can take to accomplish the desired data governance goals, such as modifying, enhancing, or adding to Brookfield's existing data management ecosystem. Among the benefits we have:

- ▶ Data Governance Program Office, Roles, and Responsibilities, Measures and Metrics, Business Terms, and Policies.
- ▶ Understand the landscape to centralize and manage their key policies, procedures, and standards.
- ▶ Have a consistent and institutional data governance approach across the company.
- ▶ An evaluation of the current level of data quality and security.



THANK YOU

Any questions?

You can find us at:

- ▶ pegasusdt.com
- ▶ info@pegasusdt.com



References

- Alternative Investment Management Association. (2020). Casting the Net: How Hedge Funds are Using Alternative Data. <https://www.aima.org/uploads/assets/221982e6-a2a6-4949-bf1d15b612424e1b/CastingTheNetUsingAlternativeData04052020.pdf>
- Brookfield Asset Management Inc. (2020). Q1 2020 Interim Report. https://bam.brookfield.com/~media/Files/B/BrookField-BAM-IR-V2/quarterly-reports/2020/Q1/BAM%202020%20Q1%20Interim_F.pdf
- Brookfield Asset Management Inc. (2020). Letter to shareholders. <https://bam.brookfield.com/~media/Files/B/BrookField-BAM-IR-V2/letters-to-unitholders/2020/F-BAM-q1-2020-ltr-to-shareholders.pdf>
- Chazal, Yoan. (2020). COVID-19 and the investment management industry. Deloitte. <https://www2.deloitte.com/fr/fr/pages/covid-insights/articles/covid-19-investment-management-industry.html>
- Gaumer, Tim. (2020, Jan 29). Finding alpha with unstructured data. Refinitiv. <https://www.refinitiv.com/perspectives/future-of-investing-trading/finding-alpha-with-unstructured-data/>
- IBM. (n.d.). IBM Knowledge Center. https://www.ibm.com/support/knowledgecenter/SSZJPZ_8.7.0/com.ibm.swg.im.iis.mdwb.nav.doc/containers/top_level_file_mdwb.html
- Informatica. (n.d.). Enterprise Cloud Data Management. <https://www.informatica.com/>
- McGivern, Matt. (2020, April 28). COVID-19 crisis exposes flaws in Master Data Sets. Protiviti. <https://blog.protiviti.com/2020/04/28/covid-19-crisis-exposes-flaws-in-master-data-sets/>
- MySQL. (n.d.). <https://www.mysql.com/>
- Oracle. (n.d.). Database Security - Try Oracle Autonomous Database. <https://go.oracle.com/LP=87699?elqCampaignId=159280>

References (cont.)

PricewaterhouseCoopers (PWC). (2019). *Crossing the lines: How fintech is propelling FS and TMT firms out of their lanes. Global Fintech Report 2019.* <https://www.pwc.com/gx/en/industries/financial-services/assets/pwc-global-fintech-report-2019.pdf>

PricewaterhouseCoopers (PWC). (2020). *How COVID-19 is affecting the asset and wealth management industry.* https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/reference_list_electronic_sources.html

PricewaterhouseCoopers (PWC). (2020). *Leading out of lockdown: Five key priorities for post-crisis asset and wealth management.* <https://www.pwc.com/gx/en/industries/financial-services/publications/awm-beyond-covid-19.html>

Wildeboer Dellelce LLP. (2020, April 20). *COVID-19 Considerations for Asset Managers.* <https://www.wildlaw.ca/resource-centre/legal-updates/2020/covid-19-considerations-for-asset-managers/>