Borealis to House Sensitive Metadata (by Thierry)

Introduction

Borealis is the Canadian Dataverse Repository. It holds data from most public Canadian universities in their own repositories called “Dataverses”. In essence, Borealis is the repository of those institutional repositories. It facilitates access to data - some of which is restricted and requires owner authorization to access the data itself. That being said, the metadata about these restricted datasets allow for their findability.

It logically follows from this that, given our goals of making restricted data findable with heavily anonymized metadata, borealis could be a central tool in our on-going endeavor. Using Borealis also has the added benefit of linking a persistent identifier to the dataset, and of being automatically converted into a standardized DDI XML file. Of course, there are certain qualms about using a national repository such as Borealis. Being a national service, Borealis data is often scrapped by foreign academic colleagues in both peer and “near-peer” nations. Given the sensitivity of this data, how “findable” we want this data to be beyond the confounds of Canada remains a point of contention.

Nevertheless, there is reason to believe that this can be done safely and effectively to preserve the knowledge of these dataset's existence and allow for them to be traced back to a persistent identifier. The present document assesses the feasibility and benefits of using Borealis as a haven for sensitive data metadata.

Creation of the CRDCN Dataverse

Before even talking about how to safely upload metadata pertaining to sensitive datasets, it is important to have an idea of how this would be done in the first place. The first step would be for the CRDCN to set up a Dataverse of their own within Borealis. This isn’t particularly difficult, but it would require discussions with the Borealis team as to where this Dataverse would be set up. For instance, not all Dataverses are immediately visible on the main Borealis page; for the most part, only academic institutions are advertised on the main page. However, there are other repositories that are “hidden” (such as the Dataverse for Odesi, the Social Science data repository operated by Scholars Portal).

The CRDCN has two main options:

1. Create their own Dataverse (not my go to)
2. Odesi Dataverse (whose explicit purpose is to house public access Statistics Canada data)

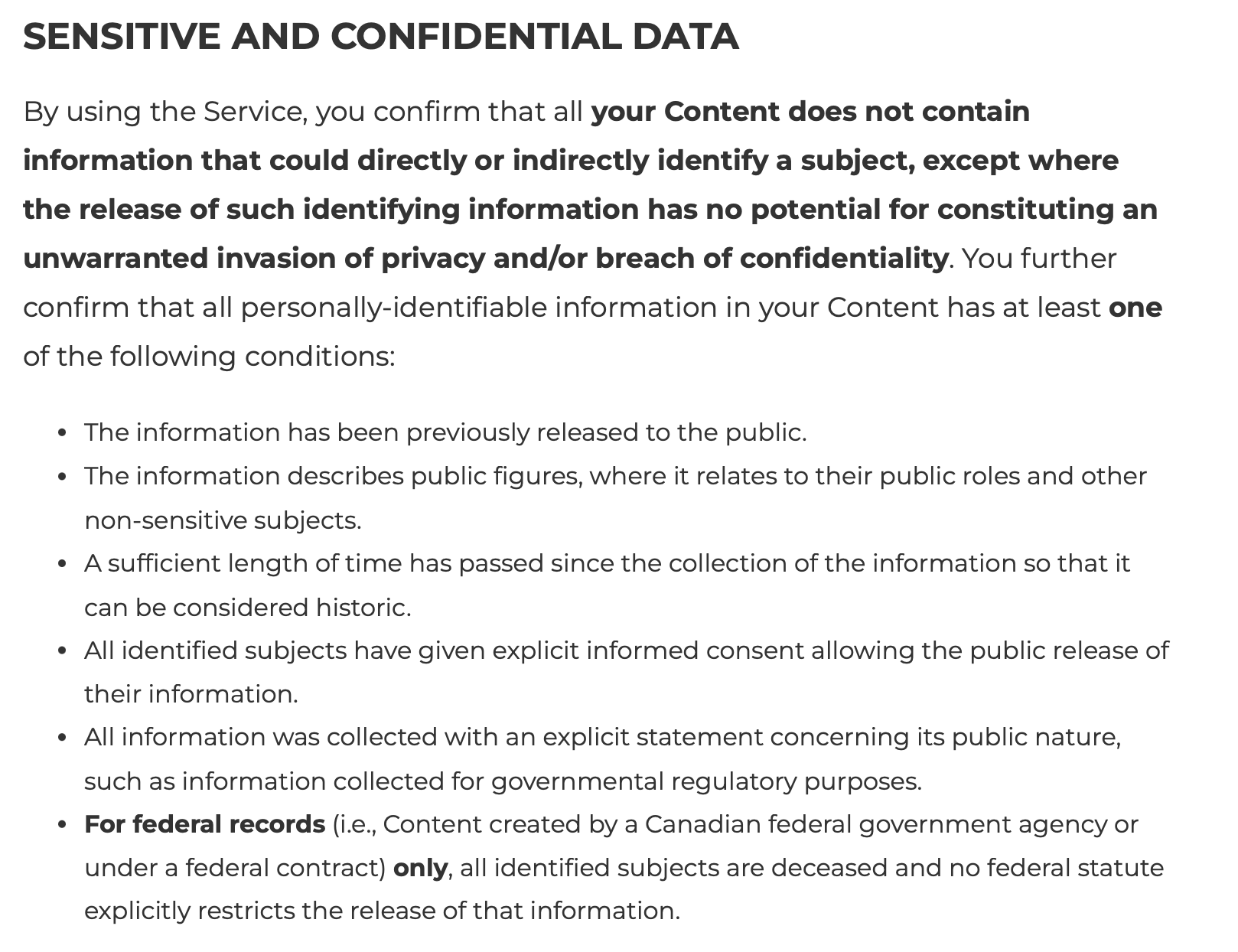
There, the Dataverse is bilingual, well fleshed out, and continually curated (in part by yours truly, me and other staff members). That being said, I don’t speak on behalf of the service – though it nonetheless seems to be me to be a viable approach. Of course discussions would need to be held in order to hash out the details.

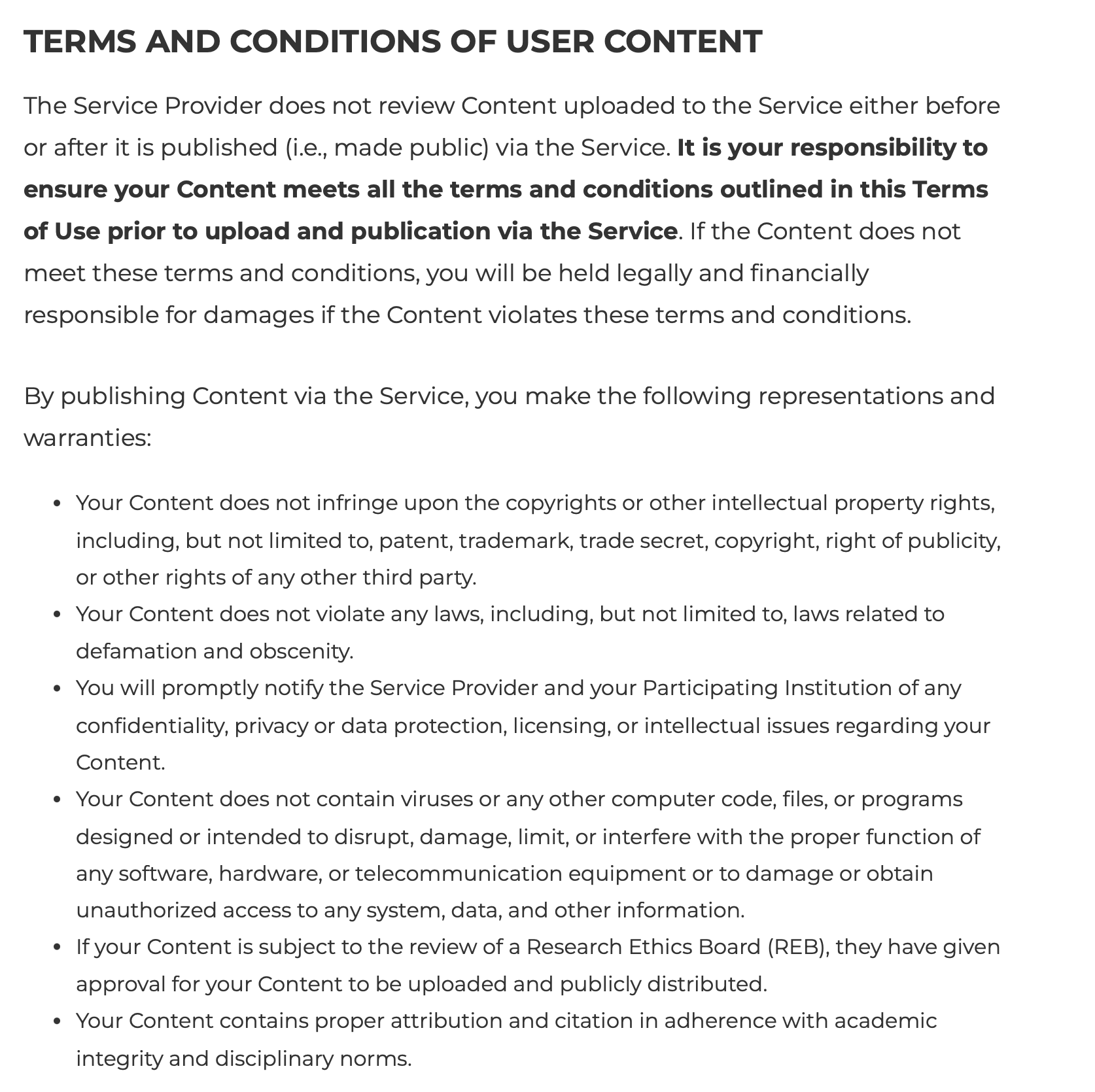
As it stands, Odesi has various Dataverses for a wide range of different data types. Given the nature of the sensitive Metadata and of the present project, not all would be suitable – nevertheless here is the list of existing Odesi Dataverses:

1. Census of Population
2. Statistics Canada Aggregate Data
3. Statistics Canada Public Use Microdata Files (PUMFs)
4. Canadian Public Opinion Polls
5. Statistics Canada Data Liberation Initiative (DLI) Licensed Data
6. **Other Canadian and Government Data**
7. International Data

As readers of the present document may have astutely noticed, (6) Other Canadian and Government Data was bolded to denote an emphasis. It is of my belief that this could be a viable repository for the present endeavour. So let us keep this Dataverse in mind and proceed to other points of discussion.

What Can and “Cannot” Go in Borealis Dataverses (Including Odesi)

Borealis does have extensive documentation about what can and cannot go into their data repositories (this is for very obvious legal reasons). I therefore recommend an in-depth read of [Borealis’ terms of use](https://borealisdata.ca/termsofuse/) page. For the sake of brevity, here are screenshots of the Terms of Use directly relevant to the subject at hand (though of course the entire Terms of Use should be carefully reviewed in order to build a convincing argument/case as to why our goals are justified, safe, and necessary for the preservation of metadata.



Our case has to be air-tight with a clear goal. Data uploaded to Borealis cannot be deleted – it can be [deaccessioned](https://learn.scholarsportal.info/all-guides/borealis/deleting-data/#Deaccessioning-a-Published-Dataset), but not fully deleted. Meaning that it cannot be removed without approval from the highest authority in the Borealis institutional hierarchy.

All this being taken into consideration, Borealis takes almost everything. As an example, a student (I hope not faculty) at Western has been uploading [Harry Potter self-insert fanvids](https://borealisdata.ca/dataverse/esapuridis) in their own Western Dataverse (which *technically* could be infringing on the fanvids’ original owners’ copyright and intellectual property rights, but I digress). The University of Toronto also has a collection of 240+ [pictures of icicles](https://borealisdata.ca/dataverse/Icicle_Atlas). My point is that anything goes in and is minted a DOI.

Copyright and Intellectual Property

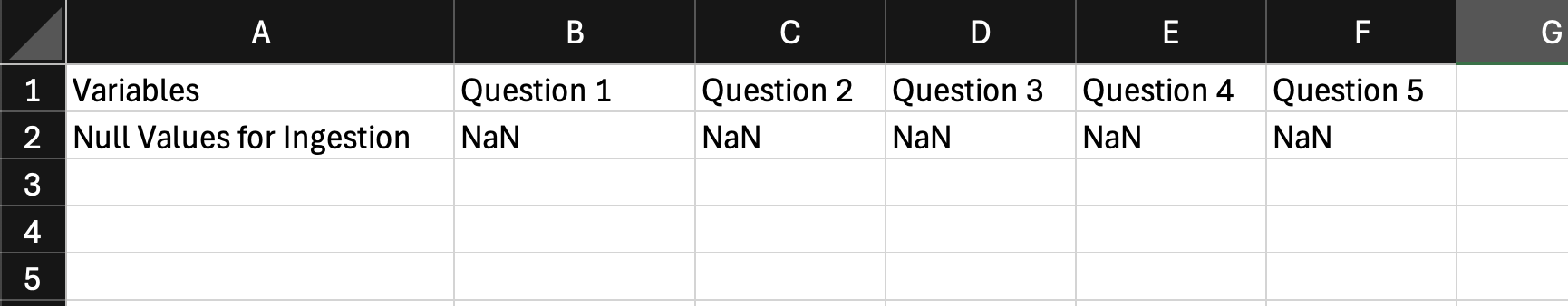
Copyright terms of service are of paramount importance on Borealis (for serious data, at least). To briefly come back to the Harry Potter fanvids mentioned above, they used “CC0 1.0” meaning that it is public domain - which it may or may not be (probably not), but by default datasets in Dataverse are given CC0 1.0 unless specified otherwise. The icicle images, on the other hand, uses “CC-BY 4.0”, which has more constraints on how the data can be used (see [Creative Commons attributions](https://creativecommons.org/licenses/by/4.0/)).

Statistics Canada datasets uploaded to the Odesi Dataverse use a custom template that go beyond Creative Commons rights to address the specific copyrights of Statistics Canada data. I’ll attach it to the appendices (Appendix A for English, Appendix B for French) of the present document. Point is, were we to upload metadata concerning sensitive datasets, we would not only need to strongly uphold Borealis’ Terms of Use, but also ensure that we do not put ourselves in any line of fire for any litigations (or adjacent actions) as this latter would prove problematic for both Borealis and the CRDCN. Provided that these terms are appropriately met, there should be no problem in preserving metadata on Borealis.

Pragmatics of Metadata Findability in Borealis

Assuming that everything aligns with Terms of Use and copyright laws, the upload process is relatively simple. Metadata in Borealis is generated both manually and automatically (assuming the uploaded file is tabular in nature such as .xlsx, .csv, .sav files – but not .RData or .json). This is precisely where we want to make an important decision: do we want a file that is ingested, thus including variable level metadata in the DDI standard XML metadata file, or do we not want that?

It is of my belief that an ingested tabular formatted file would provide the best “findability” and preservation outcomes. To demonstrate this I have conducted a small trial in demo.borealisdata.ca (data here is prone to being deleted and is to test Borealis updates before it ends up in production).

Here is the dataset itself:

It really is as simple as it gets. The first row denotes the variables (imagine that each “Question” actually denotes a Variable of some sort). Note that the “Null” entries are necessary – they can just as well be interchanged for NaN or 0 or “Cheese” or any place holder. However, it is better to just use a string input NaN as it stops the software for calculating summary statistics that it would usually compute for data points in a column. Without these Null values (meaning the dataset is composed of a singular row), the file will not be ingested.

Now here is an example between a non-ingested DDI XML file, and one that is ingested, with this same .xlsx file (note that it would be the exact same outcome were it .csv, or any other – as long as it is not json or RData; this is an issue with Harvard, not Borealis per se).

Non-ingested output:

However if the file is ingested, it also has this following section in addition to the above metadata information (note that it is truncated on the right side and bottom):

This entire entry above is not included if the file is not ingested; this would mean that we would be missing out on a lot of machine readable data were we to not ingest the files. I have already written a python code to exclusively extract variable labels if ever this were needed.

We can also bring this up a notch in terms of metadata quality by including offered response types, but NOT who responded, and how they responded – though I still need to do some testing to see what works and what doesn’t.

Appendices

Appendix A: Terms of Use (English)

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