



CSCI 5408

Assignment 1 Problem 2

Entity Identification

Entity	Reasons	Source	Attributes
Bibliographical databases	<p>This entity represents bibliographical databases maintained by each Country.</p> <p>This entity is valid since it represents different data domains and a huge volume of vital data.</p> <p>Each Database is associated with a Country_Id, database name and URL.</p> <p>This is a weak entity since it is associated with the entity Country and depends on its existence to co-exist.</p>	https://www.euro.who.int/en/publications/bibliographical-databases	Country_Id Database Name URL
Careers	<p>This entity represents different Career options that each WHO regional office presents.</p> <p>This entity is valid since it represents the type of Career and relevant information associated with the Career.</p> <p>Each Career is associated with an Id, Region, Location, Category, Requirements and Compensation information.</p> <p>This is a strong entity since it can be uniquely identified by the career_id.</p>	https://www.who.int/careers	Career_Id Region Location Category Requirements Employment Type Compensation Benefits Allowance

Cybersecurity	<p>This entity represents Cybersecurity protocols implemented by WHO.</p> <p>This entity is valid since it represents the different protocols followed by WHO and since it stores information about various phishing emails.</p> <p>This is a weak entity since not all offices implement protocols and the existence of these protocols depends upon the existence of the office.</p>	https://www.who.int/about/cyber-security	<p>Email Type</p> <p>Email Body</p> <p>Date</p> <p>Email Id</p>
Contract Awards	<p>This entity represents awards offered to Vendors based on their performance.</p> <p>This entity is valid since it represents historical information about vendors and awards offered to them.</p> <p>This is a strong entity since an award is offered to a vendor without fail and it doesn't depend on the existence of any other entity.</p>	https://www.who.int/about/accountability/procurement/contract-awards	<p>Reference Number</p> <p>Order Type (For the supply of)</p> <p>Supplier_Id</p> <p>Office_Id</p> <p>Date of Contract Approval</p> <p>Contract Amount (USD)</p>
Countries	<p>This entity represents the various countries that are part of the WHO.</p> <p>This entity is valid since it represents details of participant countries.</p> <p>This is a strong entity since each Country can be uniquely identified by its name.</p>	https://www.who.int/countries/	<p>Country Name</p> <p>Official Website</p> <p>Address</p> <p>Contact Information</p>

Diseases	<p>This entity represents the various Diseases tha have been identified and logged by the WHO.</p> <p>This entity is valid since it represents different types of diseases.</p> <p>This is a strong entity since each disease can be uniquely identified by it's strain_id.</p>	https://www.who.int/emergencies/diseases	Disease_Id Disease Name Scientific Name Date Discovered
Donors	<p>This entity represents philanthropists who donate monetary funds.</p> <p>This entity is valid since it represents contributors who support WHO.</p> <p>This is a strong entity since Donors can be uniquely identified by their registered Id.</p>	https://www.who.int/emergencies/diseases/novel-coronavirus-2019/donors-and-partners	Donor_Id Name Contribution Date
FAQs	<p>This entity represents Frequently Asked Questions.</p> <p>This entity is valid since it stores questions and answers that are useful to the general population.</p> <p>This is a strong entity since each question is unique.</p>	https://www.who.int/about/frequently-asked-questions	Question_Id Question Answer URL Date
Funds	<p>This entity represents funds contributed by Donors.</p> <p>This entity is valid since it stores various information related to Funds such as total fund, amount used and remaining.</p> <p>This is a weak entity since it depends upon the existence of Donors.</p>	https://app.powerbi.com/view?r=Funding Information	Donor_Id Total Amount (as per agreement)

			Utilized Amount Balance Flag (Cause) Start Date End Date
Campaigns	<p>This entity represents campaigns organized by WHO to spread awareness on diverse topics.</p> <p>This entity is valid since it represents details about each Campaign.</p> <p>This is a strong entity since each Campaign can be uniquely identified by the description and date of the campaign.</p>	https://www.who.int/campaigns	Campaign_Id Campaign Type Description Office_Id
Health Topics	<p>This entity represents various Health Topics that is discussed by WHO.</p> <p>This entity is valid since it represents information consumed by the general population.</p> <p>This is a strong entity since each Health Topic is unique and is associated with multiple offices.</p>	https://www.who.int/health-topics/ https://www.who.int/multi-media/details/73-million-abortion-take-place-each-year-worldwide https://www.who.int/health-topics/abortion#	Topic_Id Topic Description Topic Domain Office_Id
WHO Library	This entity represents the Digital Library maintained by WHO regional offices.	https://www.who.int/library	Region

	<p>This entity is valid since it represents information about WHO Libraries and the publications they store.</p> <p>This is a weak entity since a Library can be uniquely identified only with the help of a Regional Office Id.</p>		<p>URL</p> <p>Library_Id</p>
Data	<p>This entity represents the various forms of Data that is stored by WHO.</p> <p>This entity is valid since it represents different formats of data that is used for several purposes and for the functioning of WHO.</p> <p>This is a strong entity since it can be uniquely identified by Data Indices.</p>	https://www.who.int/data	<p>Dataset_ID</p> <p>Topic</p> <p>Size</p>
Emergency List	<p>This entity represents the Emergency Disease outbreaks tracked by WHO.</p> <p>This entity is valid since it represents information that is critical to travelers.</p> <p>This is a strong entity since each entry in the list can be uniquely identified by its subject.</p>	https://www.who.int/emergencies/overview	<p>Emergency_Type</p> <p>Emergency_Id</p> <p>Date</p> <p>Description</p>
International Clinical Trials Registry Platform	<p>This entity represents clinical trials that various countries participate in.</p> <p>This entity is valid since it stores information, about trials, that are used to develop vaccines and drugs.</p> <p>This is a strong entity since each trial can be uniquely identified by its purpose and start_date.</p>	https://www.who.int/clinical-trials-registry-platform/the-ictrp-search-portal	<p>Language</p> <p>Clinical_Trial_ID</p> <p>Description</p> <p>Domain</p> <p>Drugs</p>

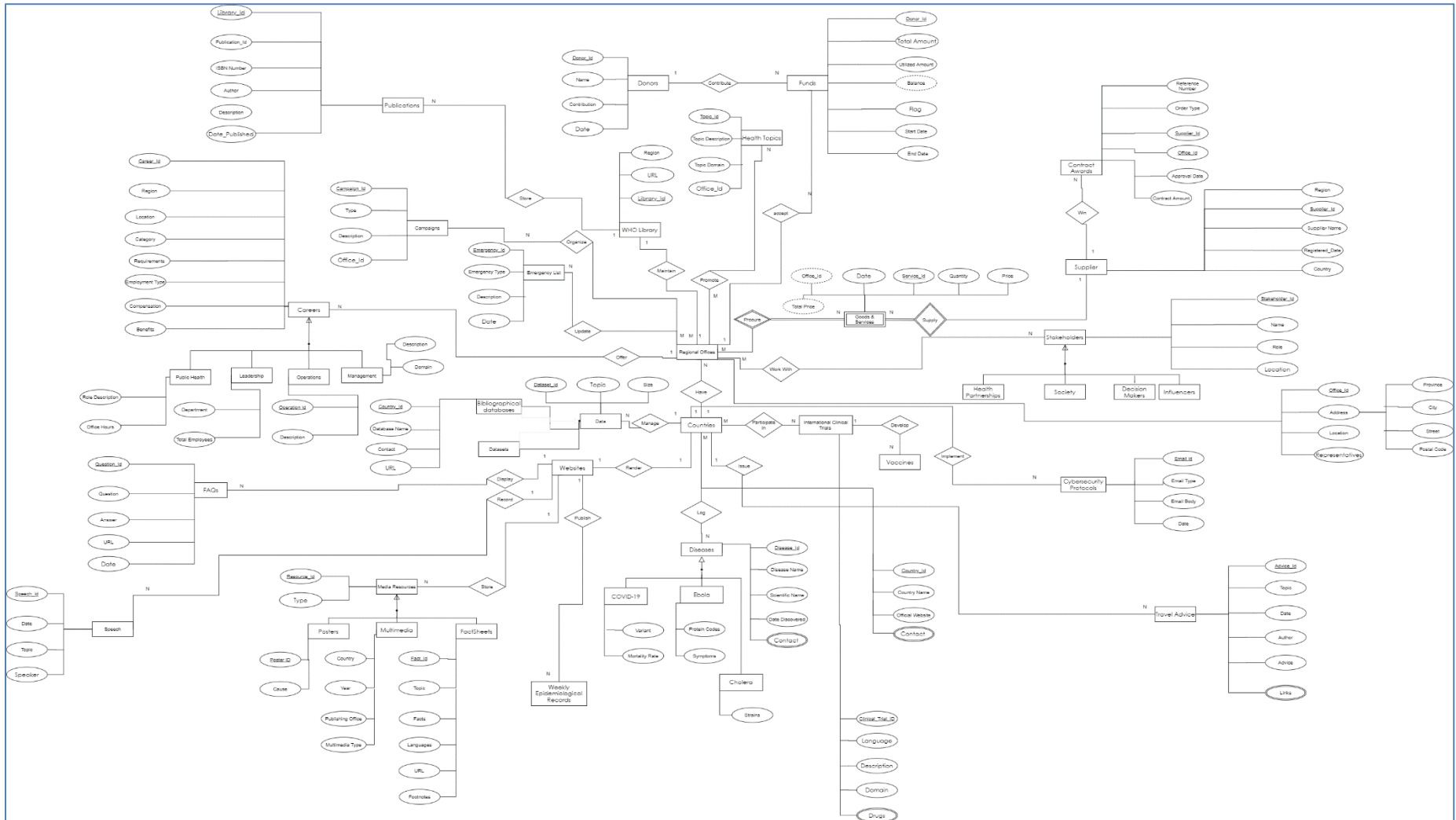
Goods & Services	<p>This entity represents services that are offered by Suppliers/Vendors to the Regional Offices.</p> <p>This entity is valid since it stores inventory and service transaction information.</p> <p>This is a weak entity since it depends upon the existence of Offices & Suppliers.</p>	https://www.who.int/about/accountability/procurement	Date Service_Id Supplier_Id Office_Id Price Quantity
Publications	<p>This entity represents the various publications stored in WHO's Digital Library.</p> <p>This entity is valid since it represents different Journals and articles that users can browse for information retrieval.</p> <p>This is a weak entity since it depends upon the existence of a Digital Library.</p>	https://www.who.int/publications	Library_Id Publication_Id ISBN Number Author Description Date_Published
Regional Offices	<p>This entity represents WHO Regional Offices in each Country.</p> <p>This entity is valid since it records information about each office such as the number of Employees and helps WHO make critical decisions.</p> <p>This is a strong entity since each office can be uniquely identified through its Id or Location</p>	https://www.who.int/about/who-we-are/regional-offices	Office_Id Address Location Representatives

Stakeholders	<p>This entity represents stakeholders who are responsible for the functioning of WHO.</p> <p>This entity is valid since it represents Stakeholder information and is critical for administrative purposes.</p> <p>This is a strong entity since Stakeholders can be uniquely identified by their Registered_Id.</p>	https://www.who.int/about/who-we-are/stakeholders	Stakeholder_Id Name Role Location
Supplier	<p>This entity represents suppliers who offer Goods & Services to the Regional Offices.</p> <p>This entity is valid since it records Vendor Information which's used in the Transaction log.</p> <p>This is a strong entity since</p>	https://www.who.int/about/accountability/procurement/become-a-supplier	Supplier_Id Supplier Name Registered_Date Country Region
Travel Advice	<p>This entity represents Travel Advisory information related to outbreaks.</p> <p>This entity is valid since is used to warn travelers about disease outbreaks in a geographical location.</p> <p>This is a strong entity since each piece of advice can be uniquely identified by the Date and topic of the advice.</p>	https://www.who.int/emergencies/diseases/novel-coronavirus-2019/travel-advice	Advice_Id Topic Date Author Advice Links

Speech	<p>This entity represents speeches offered by the Director of WHO.</p> <p>This entity is valid since it stores weekly speeches from the Director which's useful to the common population.</p> <p>This is a strong entity since each Speech can be uniquely identified by the Id in the website and the date.</p>	https://www.who.int/director-general/speeches	<p>Speech_Id</p> <p>Date</p> <p>Topic</p> <p>Speaker</p>
Websites	<p>This entity represents websites that are associated with each Country.</p> <p>This entity is valid since it records the URL and other country-specific information about each participant country.</p> <p>This is a weak entity since not all Countries may have Websites, so it depends upon the Country.</p>	https://www.paho.org/hq/index.php?lang=en	<p>Country_Id</p> <p>Region</p> <p><u>URL</u></p>
Weekly Epidemiological Records	<p>The Weekly Epidemiological Record (WER) is a valid entity as it is an essential instrument for the rapid dissemination of epidemiological information under the International Health Regulations.</p>	https://www.who.int/publications/journals/weekly-epidemiological-record	<p><u>Volume</u></p> <p><u>Number</u></p> <p>Number of Pages</p> <p>Date <u>Published</u></p>
Vaccines	<p>This entity represents the various vaccines that're developed by Who to prevent various Viral infections.</p> <p>This entity is valid since it stores detailed information about the vaccines such as dosage and efficacy.</p> <p>This is a strong entity since each Vaccine can be uniquely identified by its name.</p>	https://www.who.int/emergencies/diseases/novel-coronavirus-2019/covid-19-vaccines	<p><u>Name</u></p> <p><u>Recommended Dosage</u></p> <p><u>Efficacy</u></p>

Media Resources	<p>This entity represents media Resources that're available on WHO's websites.</p> <p>This entity is valid since it represents the different format of media resources that're available for users' perusal.</p> <p>This is a strong entity since each resource has a unique identifier.</p>	https://www.who.int/emergencies/diseases/novel-coronavirus-2019/media-resources/	<p>Resource ID</p> <p>Resource Name</p> <p>Resource Type</p> <p>Resource (File)</p>
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Initial ERD (Chen Model)



Initial ERD Discrepancies

Upon analysis of the Initial ER diagram, it was observed that there were multiple Fan Traps in the model. This was because certain Entities were associated with higher level entities instead of an entity at a lower level.

Initially Funds, Who Library, Publications and Cybersecurity were considered as strong entities but upon analysis it was determined that these are Weak entities due to weak primary keys and dependence on stronger entities.

Entities – Goods & Services, Weekly Epidemiological Records and Websites were also determined to be Weak entities as they cannot be uniquely identified by their Primary keys (Weak keys) and are dependent on other entities.

1. Resolved Fan Trap by removing relationship between COUNTRIES & TRAVEL ADVICE and establishing a relationship between REGIONAL OFFICES & TRAVEL ADVICE.
2. Cardinality Ratio between REGIONAL OFFICES & CYBERSECURITY PROTOCOLS was initially determined to be "One to Many" however, multiple offices can implement a same Cybersecurity Protocol.
3. Identified Disjoint and overlapping sub-entities in the entities - Careers, Media Resources, Stakeholders & Diseases.

Final ERD



References

1. CSCI 5408 Assignment 1 Handout
2. Tutorialspoint.com. 2022. Extended Entity-Relationship (EE-R) Model. [online] Available at: <<https://www.tutorialspoint.com/Extended-Entity-Relationship-EE-R-Model>> [Accessed 24 January 2022].
3. <https://www.conceptdraw.com>. 2022. Entity Relationship Diagram Symbols | Professional ERD Drawing. [online] Available at: <<https://www.conceptdraw.com/How-To-Guide/erd-entity-relationship-diagram-symbols>> [Accessed 25 January 2022].

Declaration

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