ASSESS, CALCULATE, RE-EVALUATE, EDUCATE (ACRE): A RISK ASSESSMENT FRAMEWORK FOR UST MIGUEL DE BENAVIDES LIBRARY

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Abstract
This study identifies the natural and man-made risks that the University of Santo Tomas (UST) Miguel de Benavides Library in Manila, Philippines is currently facing. Being the oldest existing university in Asia, its library holds materials with historical and cultural significance. For the protection of these materials, the authors did on-site visit, policy review and staff interview. Based on the findings and assessment, the authors proposed a risk assessment framework for the library.

Keywords: *risk assessment, library collection, quality assurance, Assess, Calculate, Re-Evaluate, Educate (ACRE)*

Background

The University of Santo Tomas (UST), being the oldest existing university in Asia witnessed almost all types of disasters. The evidential, historical, cultural and symbolic documents of the university's 407 years of existence are currently housed in its library. The UST University Library, also known as the UST Miguel de Benavides Library, was named after its founder Fr. Miguel de Benavides O.P. and was founded in the early 17th century when the Dominicans contributed books essential for priesthood and other sciences education. At present, it has 16 sections that house different types of collection, serving and addressing the information needs of the whole Thomasian community (University of Santo Tomas, 2016). As for the preservation and protection of these materials, the UST Library, in coordination with the UST Crisis Management Committee, has an established emergency plan. However, the library disaster plan

and risk assessment program have not been done or updated for decades already

The Philippines is identified as one of the riskiest and most disaster-prone countries in the world (Kostigen, 2015). In 2009, Tropical Storm Ondoy (International name: Ketsana) produced a remarkable and record-breaking amount of rainfall in a single day that resulted in massive flooding, especially in Manila, Philippines and its nearby towns (Zuellig, 2009). In this disaster, floodwater flowed like a raging river; submerging low-lying places (Act for Libraries, 2017). In 2013, super typhoon Yolanda (International name: Haiyan) caused catastrophic and deadliest destruction in Visayas, particularly in Samar and Leyte. Starting from 2012 to 2014, Habagat (southwest monsoon) also brought rainfall and massive flooding. These natural disasters posed threats both to human lives and cultural heritage. For instance, referred to as "The Great Flood" by the Thomasian community, the Typhoon Ondoy in 2009 put the whole UST campus in deep water. It was the was worst in the last 40 years of the university's existence. There was a strong flow of water coming from the drainage canal, andsome leaks in a few areas were also spotted. There was minimal flooding in the Main Library, but the two branch libraries, the Ecclesiastical Library and the Grade School Library were submerged in water, with the latter having approximately 600 damaged books (Majuelo, 2009).

Within this context of protecting the library and its materials from various possible risks, the need to do risk assessment arises. The Council on Library and Information Resources (2014) defines risk assessment as the identification and analysis of internal and external risks relevant to the achievement of objectives. Prideaux (2007) noted that, it is necessary to identify risks and have a systematic review of premises and activities that have the potential to cause harm and damage to people and resources. Completion of risk assessment ensures that hazards, risks, and the methods for controlling risks are properly documented and can be used to communicate this information to relevant stakeholders. Library managers should always remember that a single risk can have multiple effects: additional costs, delays, penalties and reducing the quality of services. Boin and Lodge (2016) emphasized that a well-set up library includes assessing and prioritizing the hazards and risks. With these risks and the need to mitigate them, this paper identifies and assesses the potential natural and man-made risks and how the UST Library can address them.

Table 1
Qualifiers and Quantifiers to Risk Assessment Factors

Quantitative Values	Qualitative Values	Probability of Occurrence	Effect on Collection	Recovery Time	Financial Impact
1	Low	Once per century	1% of collection	One week to one month	PHP 100,000 or less
2	Medium	Once per decade	50% of collection	More than one month but less than six months	More than PHP 100,000 but less than PHP 500,000
3	High	Once per year	90% of collection	More than six months to one year No idea with mitigation	More than PHP 500,000
0	—	—	—	No idea with mitigation	—

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Table 2
Relative Rating

Quantitative Values	Qualitative Values	Probability of Occurrence
1-9	Low	Risks that must be eliminated or significantly reduced
10-18	Medium	Risks that need to be monitored, mitigation plan must be in place to reduce risk
19-27	High	Requires less attention but not to be totally ignored

Methods

To meet the study's objective, the methods done were in two phases: Phase I included on-site visit, facility and library assessment, policy review and semi-structured staff interview. The interview with the staff allowed direct observation which enabled the study's proponents to put behavior in context and make it more understandable. According to Gay (2009), the advantages of observation include: researcher has first-hand information, he/she can record information as observed, unusual aspects can be noticed during observation, and it is useful for exploring topics that participants may feel uncomfortable to discuss. A consultation meeting was first conducted with the chief librarian of UST to review existing and available data, information materials, and other risk assessment plans and templates. On the succeeding visits, the librarians participated in the staff interview.

Phase II included the use of a survey questionnaire as an assessment tool. It was developed using Beth Patkus' (2003) Self-survey Guide on Assessing Library's Preservation Needs, Smithsonian National Postal Museum's Identified Agents of Deterioration and University of California Library Collections Risk Model. With the use of qualifiers and quantifiers (see Table 1), such as Probability of Occurrence, Effect on Collection, Recovery Time and Financial Impact, the level of sensitization of library managers on disaster preparedness, response and recovery, examination and identification of library risks/ threats, and level of staff sensitization on disaster issues and concerns were covered

A simple mathematical formula was then used to calculate for the relative rating to determine the risk that was likely to occur and with the greatest impact. The following formula and description of values were used:

RELATIVE RATING = Probability of occurrence X the sum of impact, (i.e. effect on collection + recovery time + financial impact).

Once risks' relative ratings are computed, qualitative values from University of California Library Collections Risk Model (2009) Low, Medium, High can be assigned. The maximum possible value to be derived from risk rating is 27. Since there are 3 qualitative values, a simple division will be performed to get the range for each risk rating: 27/3 = 9 (See Table 2).

Findings, Conclusion, and Recommendation

The most common risks associated with libraries and collections are fire, light, moisture, bug infestations, theft, vandalism and power surges that can destroy library's digital / electronic collections (Polastron, 2007). Phase I of this research included on-site visit and assessment of UST Miguel de Benavides Library's preparedness to the identified risks. The following facilities, equipment and practices were observed:

Table 3
Relative Rating of Risk Events Caused by Natural Disasters

Risk Event	Probable Cause	Relative Rating
Building collapse	Earthquake / Explosion	16.7
Flood	Storm / Heavy rains	11.8
Fire	Lightning / Earthquake effect / Explosion	11.7
Mold	Poor storage / Humidity issues	9.9
Chemical spills	Gas leaks	3.3

- CCTVs in the building to address theft and vandalism risks
- Ventilation and air conditioning to address light damage risks
- Secured doors to address fire and theft risks
- Alarm systems, emergency lights and fire extinguishers to address fire and power surges risks. More specifically, the Library has 213 smoke detectors, 34 bells, 2 heat detectors, 35 strobe lights and 1 fire alarm control panel.
- Authorization and security to address theft and vandalism risks

It was also observed that only one of the sixteen sections in the library, the Antonio Vivencio del

Table 4
Relative Rating of Risk Events caused by Man-Made Disasters

Risk Event	Probable Cause	Relative Rating
Collapse of shelves	Overloading of shelves	19.7
Insects, Termites, Rodents	Food / Infected items / Poor storage	10.7
Mold	Fluctuations in humidity caused by neglect	9.9
Fire	Arson / Faulty wiring	9
Light	Overexposure to natural or artificial light	8.2
Flood	Faulty plumbing / Leaky roof	7
Theft	Inadequate security	6.6
Vandalism	Inadequate security	6.1
Chemical spills	Improper storage and/or use of chemicals	3.7

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Rosario UST Heritage Library, has dust accumulation and humidifier to prevent light, bug infestation and moisture damage risks. Moreover, the Head Librarian also confirmed that humidity is regularly monitored and maintained.

Among the identified risk events caused by natural disasters, three garnered Medium rating (Quantitative Values of 10-18), and the highest are: building collapse, flood and fire (See Table 3).

Among the identified risk events caused by man-made disasters, one garnered High rating (Quantitative Values of 19-27): collapse of shelves while insects, termites and rodents garnered Medium rating (Quantitative Values of 10-18) (see Table 4).

Given their high probability of occurrence as assessed by respondents, two natural disasters were identified to be the highest risks to the library (see Figure 1). One is earthquake or explosion. UST Miguel de Benavides Library is located in Metro Manila. It should be noted that a study done by the Philippine Institute of Volcanology and Seismology (PHIVOLCS) showed that an earthquake of at least 7.2 magnitude from the West Valley Fault could devastate Metro Manila (Santos, 2014). University officials noted that should the magnitude 7.2 earthquake hit Metro Manila, apparent damages could be expected. But according to the interviews with the respondents, buildings inside the UST campus would not give in to earthquake as they were built to endure earthquakes as strong as magnitude 8.0. The UST Miguel de Benavides Library building was inaugurated on October 29, 1989 and the authors and the librarians of UST hope that similar to the UST Main Building, which endured four major earthquakes in 1937, 1968, 1970 and 1990, it can also withstand a major earthquake.

The other natural risk identified to be of highest threat to the library is storm or heavy rains which can cause devastating floods (see Figure 1). UST Miguel de Benavides Library is located in one of Manila's flood-prone areas. Dubbed as the "Great Flood," Tropical storm Ondoy in 2009 was considered as the

Figure 1

Natural Risks: Probability of Occurrence and Effect on Collection

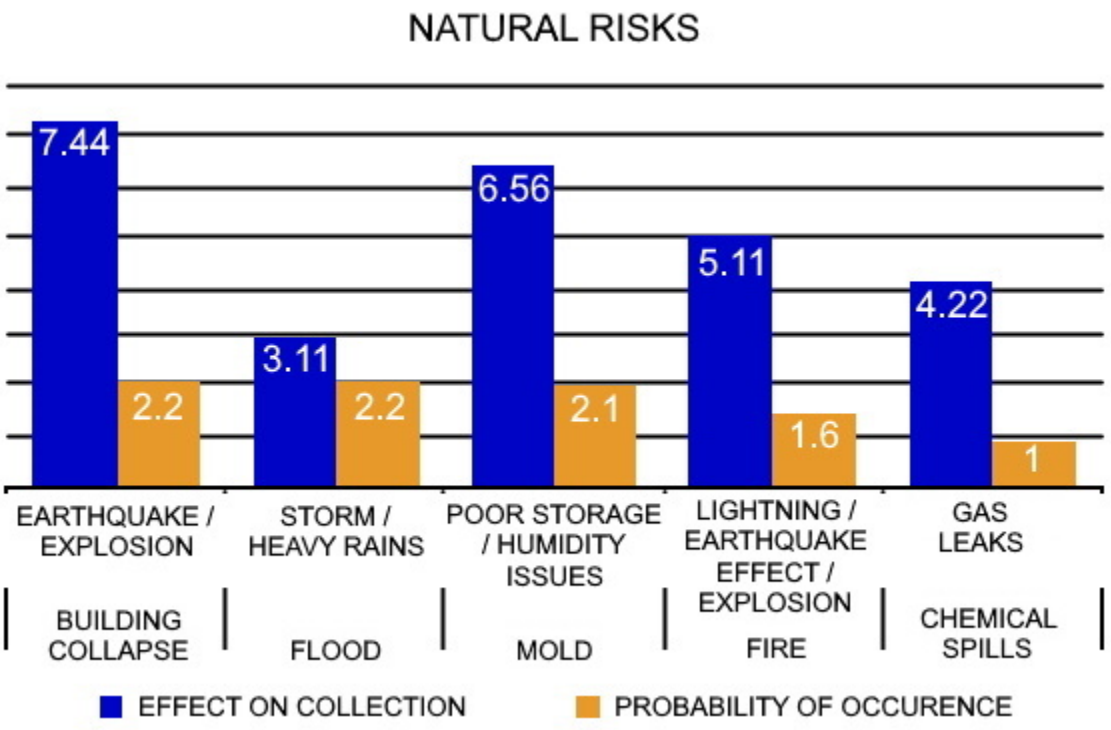
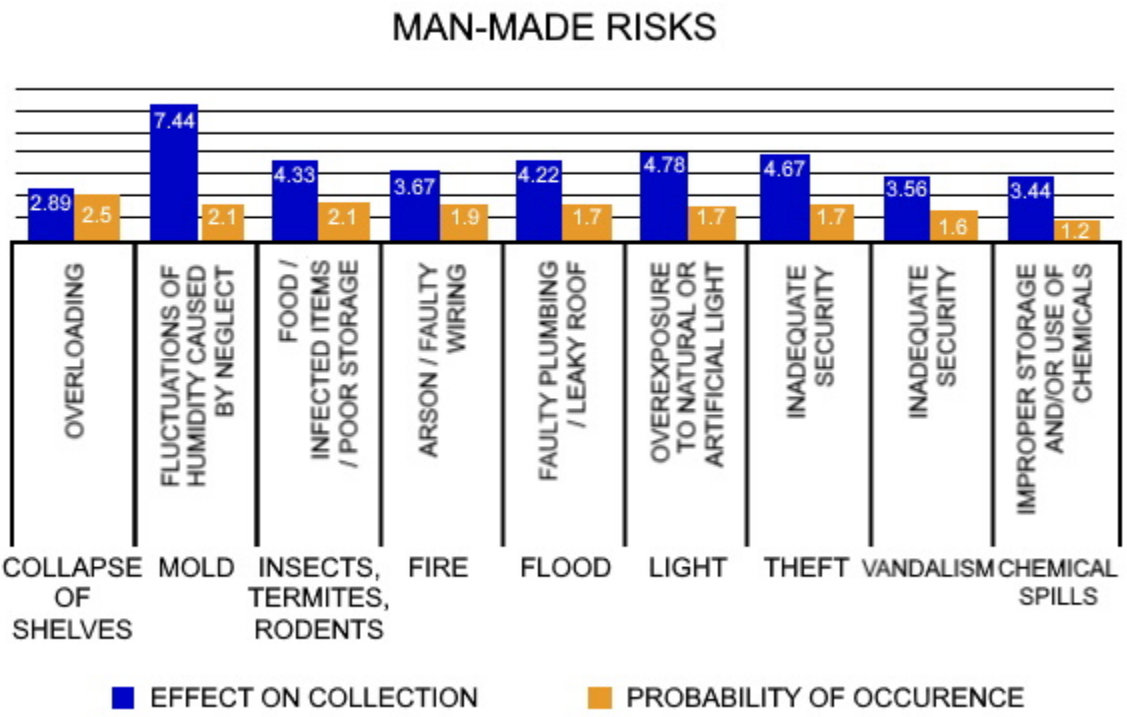


Figure 2
Man-Made Risks: Probability of Occurrence and Effect on Collection

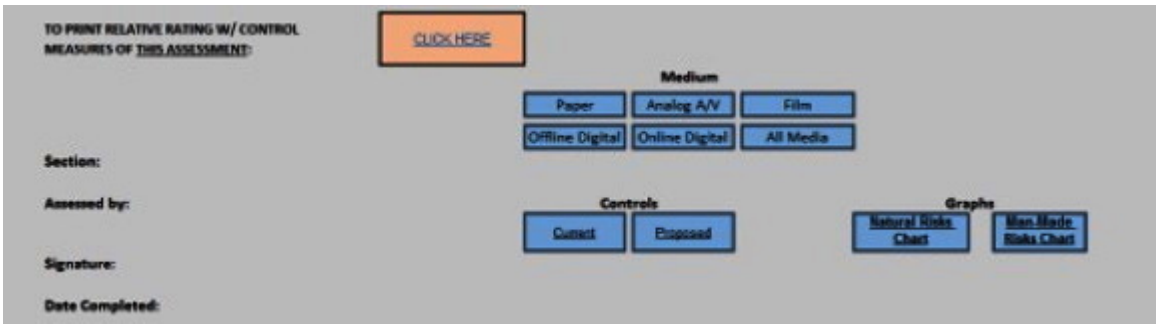


worst in the last 40 years. There was minimal flooding in the UST Miguel de Benavides Library, but the two branch libraries, namely, the Ecclesiastical Faculties and the Grade School Libraries were badly affected (Majuelo, 2009).

Among these natural risks, earthquake or explosion is identified to have the most significant impact to the Library (see Figure 1).

As assessed by the respondents, overloading of shelves which can cause collapse has the highest probability of occurrence among identified man-made risks (see Figure 2). The UST Miguel de Benavides Library has no recorded incident of major shelving collapse due to overloading. In majority of the sections, the open-shelf system whereby users have direct access to the collection is adopted. The Library Administration acknowledges that a non-

Figure 3
Interface of the Interactive File of the Tool, University of California Library Collections Risk Model



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structural hazard including unsecured or unbraced library shelving or failure to practice shelf asymmetry, that is, having too many or heavier books on one side can cause collapse. The previous Library Administration had consulted with trained professionals to examine and suggest a method to properly reinforce library shelving. It is hoped that the current Library Administration will also do the same.

Although collapse of shelves has the highest probability of occurrence, the respondents identified mold infestation to have the most significant impact to the Library (see Figure 2). The respondents acknowledged that since risk assessment is not done regularly and only the head of Antonio Vivencio del Rosario UST Heritage Library has formal training on preservation and conservation, she is the only one who understands very well the significance of regular maintenance and monitoring of light, temperature and humidity.

When risks are identified, and their effects are realized, destructive impacts can be reduced. It is suggested that risk assessment be done at least once a year, during one of the Library's research break weeks. It is recommended that it must be done one at a time and follow the steps according to **ACRE**.

Assess

Vital areas of each section's collection should be identified. It is important to prioritize collection because it will help responders identify protection needs and guide salvage efforts after the disaster. By identifying highest priority assets, responders will not lose valuable time and resources saving low value items. It is suggested that the following questions be considered in prioritizing collection and creating salvage priority list:

- Can the items be replaced? If yes, would the cost of replacement be more than the cost of restoring them?
- How would loss of the items impact the University's mission?
- Will the items require immediate attention because of composition (vellum, water-soluble inks, coated paper, etc)?

See Appendix A for a sample Collection Salvage Priority Template / Form. Priority 1 items are packed first unless they are not in danger or if it is impossible or too dangerous to access them. They are prioritized for post-disaster mitigation or proactive conservation methods. Collection Salvage Priority should be marked on the floor maps, ensuring that they are known and understood.

Calculate

As this study focuses on paper-based collection, it is suggested that calculation be made on other forms of media. The concept of University of California Library Collections Risk Model, an interactive file for easier calculation of probability of occurrence and effect of identified risks can be adopted. This tool will allow users to evaluate risks to collections. Results can be used later to help library managers set priorities for implementation of controls. The tool can be downloaded through this link: https://goo.gl/fuMSJB. See Figure 3 for the sample interface of the interactive file of the tool University of California Library Collections Risk Model.

Re-Evaluate

Using the Prevention and Preparedness Measure Form (See Appendix B), it is suggested that a preparedness review of the library be conducted.

Educate

Even the best, well-written library disaster plan and most up-to-date phone list will be greatly compromised if the staff members are not properly trained on how to implement the plan and perform the steps immediately after the disaster. Training on response for collection damage is critical for testing procedures, looking for problems, and discussing solutions. Training will build confidence among the librarians and staff, and can bring success to the disaster response and recovery activities. It is important to note that the library disaster plan is never absolute and has to be reviewed and updated regularly. To better utilize ACRE, a RACI (Responsible, Accountable, Consulted, and Informed) Chart is recommended. This chart can help the experts, librarians and staff know and do their responsibilities in assessing and responding to

the various risks and dangers. See Table 5 for the RACI Chart created for this study.

To continuously improve the library, it is hoped that ACRE be utilized in order to determine and note some other additional risks and controls in the library. Risk assessment should be performed regularly, at least annually by head librarians of each section. This is to ensure the inclusion of best practices and improved procedures.

Table 5
RACI Matrix

Tasks	Building Experts	UST Crisis Mgmt.	Prefect of Libraries	Chief Librarian	Section Heads	Partners and Sponsors	Preservation Experts
On-site assessment, library preparedness review	R/C	A	I	I			
Identification of collection salvage priority		I	I	A	R	I	I
Assess risks to collection			I	A	R	I	C
Response for collection damage			I	A	R	I	R/C
First aid training		A/R	I	I	I	I	
Identification of best practices and improved procedures			I	A	R	I	C
Staff training			I	A	R	I	C

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Appendix A

Collection Salvage Priority Form

SECTION: Humanities

Collection	Priority 1	Priority 2
Nick Joaquin Personal Collection	X	
Biographies / Autobiographies		X
Photography	X	

Appendix B

Prevention and Preparedness Measure Form

Items to be checked	Person responsible	OK	Should take action
Building (for structural problems)			
Termite or insect problems			
Ceiling (for cracks, leaks, etc)			
Walls (for cracks or seepage)			
Windows and ventilators			
Toilets, sinks or water coolers			
Electrical wiring (is not loose)			
CCTV (functionality)			
Fire alarms, smoke detectors and fire sprinkler			
Humidifier			
DATE CHECKED:			