Paperless Thesis Submission

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*Abstract*—Every year a huge amount of paper is being used in Thesis/Report Submission in the Universities. Interestingly, a huge portion of these bulky paper works are simply discarded because it contained errors or due to inappropriate formatting. And the resubmission process is not only time consuming but also wastes a huge amount of paper. Storing these documents also requires a larger space, thus few proportions is kept. It is not only waste of space and resource but also has a negative impact on the environment. A large amount of greenhouse gases is being released during the processing of paper.

In this world of growing technology, it has now become more meaningful to store a digital version of these documents. Day by day more and more organizations are incorporating "Go paperless" concept because not only does it makes storing documents easier and reduces the chance of losing them but also contributes towards a greener environment.

To solve the aforesaid problem, we propose a convenient, secure and more efficient, “Greener” solution that reduces the carbon footprint of academic document management system. Precisely, would allow online submission and storage of these important documents such as thesis, reports etc. and would also ensure the exact formatting and other aspects of the documents prior to submission. (*Abstract*)

# Introduction

Scholarly composing is a fundamental part of any learning procedure so as to empower instructors to assess every understudy's degree of comprehension and inclusion in the subject. The readiness of any scholarly paper is the ideal method to invigorate the information regarding the matter and guarantee that understudies can work with this information, direct logical research and lead an examination.

Writing a high-quality academic paper requires hard work including looking for reliable and confirmed sources, preserving the professional academic claim, reviewing research conducted and drawing conclusions.

But A large amount of papers is being used up in the thesis submission process in Universities in Bangladesh every year. Most of these papers are either discarded due to errors, become obsolete over time, or are lost. Storing these large amounts of papers also requires quite huge amount of space, and are also inconvenient to carry around.

Papers are made from trees and trees are inevitable for living beings to survive on earth. So, for making papers human being are cutting down valuable trees causing deforestation. Besides deforestation, paper industries are producing carbon-dioxide which plays a vital role in Global Warming. If we can build a system that will reduce the paper consumption in Educational Institutions like Universities resulting in less paper production, we might be able contribute towards a “Greener” and more sustainable environment, and help prevent climatic changes that are now taking place. The paper consumption of universities and offices is playing a great role is the increased emission of CO2.

A carbon footprint is the set of greenhouse gas emissions caused by something. It can be calculated for a product, service, person, even a country, and is used to understand the impact human activity is having on the earth’s climate. The carbon footprint of paper products is defined as GHG emissions emitted during the life-cycle of paper.

Here is an approximate number of students in the following universities in Bangladesh and the number of papers used to submit thesis paper by each student in each year and an approximate Carbon footprint of it is calculated:

A complete Thesis paper contains 60-70 pages. If each student has to submit one thesis paper each containing 60 pages, then 890078 students will submit 890078 thesis papers containing 60\*890078 pages = 53,404,680 pages every year.

An A4 paper measures 0.21m by 0.297m. Therefore, a paper of 80GSM A4 weighs 5grams and 53,404,680 pages weighs 267.02 tons. In producing 1000 papers, it has a carbon footprint of 6,000kg (from energy required to create the paper and dispose of it in landfill eight times).

Thus, in producing 53,404,680 pages, approximate carbon footprint is (53404680\*6000)/1000 kg = 320428.08 tons.

Volume of a paper = length\*width\*thickness = 0.21\* 0.297 \* 5\*10^-3 cubic meters = 0.00031185 cubic meters.

So, 53,404,680 pages will occupy space of, 53,404,680 \* 0.00031185 cubic meters = 16654.25 cubic meters.

Meanwhile, a typical database contains 5,500 carbon footprint data items for materials, energy, transport etc. which is less than paper production.

Now the important term that most organizations use paper-based processes that brings face security risks due to paper documents that have (a) been lost, (b) been damaged, (c) been misfiled, or (d) fallen into the wrong hands. In 2011 from various sources it was found that “more and more companies and organizations are making the shift toward electronic filing, saving space and increasing security. Large computer servers have the ability to store mass quantities of information in a secure state and location. Digital documents stored on these servers can be easily retrieved within minutes, which increases employee productivity due to the elimination of the chore of searching for misfiled physical documents (Paperless Office, 2009, p. 16).

Collaboration efforts using paper documents prove challenging at times. Employees cannot easily distribute or share paper documents compared to their digital counterparts (Welsh, 2007, p. 11). Organizations that have replaced paper-based processes with paperless processes performed on a computer or other device enjoy greater flexibility with digital documents. “Digital documents are easier to search, share, and backup than paper documents, and they take up essentially no space” (Kissell, 2013, p. 77). Stratton (2013) notes “electronic files allow better access and information sharing, cost less in terms of physical space and personnel, and can increase productivity—all of which add to the bottom line” (p. 44).

So, Our Project is to base on this paperless thesis submission so that we can move to go green concept. This system would allow the students to submit and store their papers online. The system would let the students know if their written documents violate any formatting rule provided by their teachers. Once submitted the teacher can view these papers online. Not only this would help reduce paper wastage but would also make the document submission process more convenient and also the students would be able to find their documents in one place pretty easily without worrying of losing them. And moreover, teachers could also use this system for all their document submissions, and thus would be able to keep track of all of them very easily.

# Tools Selection

## Journal Review

A research on paper waste management was conducted by U. Arena on paper title “Environmental Assessment of Paper Waste Management Options by Means of LCA Methodology”.

In this paper, they had used to assess and compared the environmental performances of three alternative options (land-filling, recycling, and combustion with energy recovery) that could be used in Italy to manage paper and board packaging wastage. In this specific case, they showed that paper use should be viewed in the context of the international trade in bio-fuels.

Scenario on Waste Management: In the recycling scenario three represents the reference case, with the other two scenarios defined by their differences from this scenario. Scenarios a and c were represented by the best available technologies, to represent a possible new investment in alternatives to scenario b. In each scenario, the paper waste management sites (land-filling, recycling, combustion with energy recovery) are located in Italy. Paper production from virgin fiber is located in Sweden (where most of the fiber used in Italy is produced) and includes sericulture and harvesting, debarking, and chipping. The burdens related to the transportation of virgin fiber, from Stockholm to Rotterdam by ship and from there to central Italy by train, are also incorporated.

a. Landfilling. This situation covers the collection of 1.17 t of paper waste and its transport to a landfill, as nicely as the traditional manufacturing of 1 t of packaging paper from virgin fiber to provide the product made by recycling in situation b. A trendy landfill is considered, with excessive integrity bottom and top membranes for leachate containment, leachate therapy with the aid of reverse osmosis, high effectivity (55%) of biogas collection, and 60% of the accrued biogas burned in a fuel engine with an electrical conversion efficiency of 35%. The ultimate 40% of amassed biogas is flared to convert hydrocarbons to carbon dioxide and for this reason reduce its greenhouse warming effect. sixteen The amount of leachate produced used to be estimated to be 400 dm3/t of paper waste landfilled over a duration of 30 years: the price basically depends on local rainfall, the integrity of the sealing of the landfill, and the

Original water content of the buried waste. The conservative assumption was once made that the composition of the liquid effluent just met regulatory requirements. Biogas production was estimated to be a hundred and twenty standard cubic meters (at a reference temperature of 20 °C and 1 atm) per ton of paper waste. 15 The primary components of the landfill gasoline are methane, usually 50-55%, with the balance being often carbon dioxide plus less than 1% of hydrogen sulfide and different natural compounds. The time scale for quantifying the leachate and biogas

Emissions is related to the time required for the landfill to end up wholly mineralized, that is, 30 years.

b. Fiber Recycling. The recovered paper processing system varies in accordance to the paper grade to be produced and the kind of waste paper used. Recycled fiber (RCF) approaches can be divided into two main categories: (1) techniques with mechanical cleaning and deinking, which produce recycled products such as newsprint, tissue, printing and replica paper, magazine paper, lined board and carton board, and (2) processes with solely mechanical cleaning, i.e., without deinking, which produce down-cycled products such as test liner, corrugated medium, uncoated board, and carton board. All the strategies intention to separate paper fibers from impurities and contaminants by way of deliberation, deflating, and elimination of impurities. The procedure waft layout of the RCF mill, devoted to the coaching of secondary fiber packaging paper and board (i.e. recycled product), which has been used as the reference system for this study.

During the pulping stage, coarse rejects are separated, while in the successive multistage cleansing and screening tiers heavy particles, flat contaminants, stickiest, and exceptional sand are removed, main to deflating of the stock to supply suitable optical homogeneity. The review by EIPPC1 small print all the direct environmental burdens associated with this type of mill (Figure 6). The operations from entry to the foreground up to the RCF mill differ between distinct kinds of waste. For example, carton boards accrued from supermarkets and process scrap from paper manufacture require no sorting, only packing and transportation. However, some aspects are

Common to all wastes and products: all solid waste from sorting stations is routed to landfill (modeled as in scenario a), whereas waste from reprocessing is taken as 50% landfilled and 50% burned with power recovery (as in state of affairs c).As stated above, the complete recycling chain was once modeled for every of the most important Italian commercial products with the particular waste used for its production.

c. Combustion with Energy. Recovery This situation covers dedicated combustion of 1.17 t of accumulated paper waste with recuperation of electrical energy dispatched virtue distribution grid and consists of traditional manufacturing of 1 t of packaging paper in Sweden (Figure 4). A net calorific fee (LHV) of thirteen MJ/t has been evaluated on the groundwork of the composition of the accumulated waste. The waste-to-energy unit consists of three sections: combustion, strength recovery, and flue fuel treatment. A cellular grate furnace is the predominant factor of the combustion section. The strength recuperation section is assumed to have a conversion effectivity of 27.7%, which is high however possible with a modern day plant. A semidry scrubber for acid treatment, a fabric filter for casting off fly ashes, and selective catalytic reduction to reduce NOx and organic micro pollutants comprise the flue gasoline treatment. Final gasoline emissions are assumed to be those conceivable with perfect operation of these best available technologies and are well within regulatory limits. The inventory additionally takes into account all the environmental burdens associated to the conditioning of ashes and their disposal.

## Integrated Cloud Storage on Paperless Thesis Examination

The advancements in technology has digitized almost all aspects of the present world. And the Internet is one of the most influential advancements in technology. And cloud computing has become one of the trends now. Many organizations are now incorporating cloud computing systems to provide a seamless, efficient and “Greener” management systems.

Paper consumptions results in increased cutting of trees and thus contributes to Global Warming. And with the advancements in technology it is now possible to think about alternative to help reduce the usage of paper, and make a “Greener” and sustainable environment. As people are becoming more aware, more and more organizations are trying to help contribute towards a solution to this issue.

The paperless thesis examination system is one of the systems developed in cloud computing. Nowadays, there are universities which developed and implemented paperless thesis examination system. The thesis documents are saving on the university's internal servers. The development of cloud storage can use as a storage media for thesis documents. Therefore, this paper discusses the design of paperless thesis examination information systems integrated with cloud storage. As a result, not only the systems are becoming more efficient but are also contributing towards reducing the carbon foot-print.

Many researchers have developed a paperless thesis examination system to improve the quality of the system to be better for use in universities. Based on a review of existing systems, the popularity of cloud storage has not been implemented in the system.

The proposed system to be designed will focus on student activities in the process of uploading the thesis document. The system to be designed will be integrated with academic information system account. So that every student can login without register first. The proposed system focuses only on the registration of a paperless thesis examination. Student activities on this system consist of access to information and thesis examination requirements, filling out forms and uploading requirements, uploading documents and viewing thesis examination schedules and examiners.

Each student is required to have a cloud storage account to gain access uploading documents.

Coordinator or Staff is the admin that manage all of students and lecturers activities.

Divergent the students and staff, the lecturer's activity only sees the thesis examination schedule and downloads the student thesis document to be examined by the examiner lecturer, and the supervisor is a carbon copy.

The proposed method in this paper focuses more on the use of cloud storage as a data storage to reduce the use of storage capacity on university server. Table II describes the data to easily highlight the advantages.

In conclusion, since a long time ago, the paperless thesis has been developed to require in the educational scope. There are many researchers who research in this scope which have an impact on improving the system. While the systems that integrated with cloud storage, user’s login to information systems and cloud storage accounts. If the user has not a cloud storage account, the system will direct the user to create an account for uploading or downloading the document thesis.

# Proposed method

The proposed system would consist of a centralized database and server to maintain and store the submitted thesis papers. The system would not only help to store and thesis papers but would also perform checks on the document formatting to identify whether it is correctly formatted and plagiarism checks prior to submission, which is quite unique up until now. Students and teachers would have their respective accounts with students being able to submit, store and view the thesis papers and teachers would be able to view those thesis papers or upload the templates which would be used for the format checking.

Each student is required to have an account to use this service. To create an account, a student must fill up the form provided by the system, with the student identification number provided by the University. Internally, the system would validate the request by acquiring information from the university server and create a new account. Registered students would then be allowed to use the services provided by the system. As mentioned earlier, each student would be allowed to submit a new thesis file, revise the submission upon requirement, and view submitted thesis files.

Similarly teachers would also require to have their respective accounts, and to create an account, a teacher is also required to fill up the respective form provided by the system, where they would require to provide with the teacher identification number provided by the University, and after a successful validation, the new account would be created. Teachers would be able to upload template files, which the system would use to validate the format of the document, and they can also verify any thesis paper submission requested by a student, and view the thesis file any time after it is successfully submitted by a student.

After a student has uploaded a thesis paper for submission, the file would first be stored into a temporary storage in the server. The system would then compare the format of the submitted document with the template uploaded by the teacher for the particular submission, and then notify the student of certain errors, if there is any, otherwise the system would send a confirmation request to the concerned teacher. The document can be revised any number of times during this period. After a successful validation from the teacher, the document would then be permanently stored into the server. Any revision of the document from this point onwards would require to the pass through the above-mentioned steps again.

The students would be able to view their submitted thesis papers for free for a limited period of time. But teachers would always be able to view the papers..

# Tools Selection

The system would be built using HTML, CSS, JavaScript, Python, Django (Python-Web Framework)

Since the system would be implemented using the Client-Server architecture, using a web application would ensure an easier solution for a wide variety of devices. Only a device with a working Internet Connection and a Web-Browser would be required to use the service.

HTML5, CSS3 and JavaScript would be used to build the client side of the application. The user interface would be a responsive interface to ensure a seamless experience across most of the devices. The server side would be built using Python (Django).

Python is one of the most used Programming Languages that are being used now, due to its strong emphasis on readability and efficiency compared to other languages like PHP. It is very easy to learn compared to many other languages and many complex functionalities can be implemented with very few lines of codes. Apart from that, Python is also very flexible, that is, it has several robust integrations with other programming languages. For example, CPython - integrated with C, Jython – integrated with JAVA and so on. And since, it is quite popular among the programming community, it offers a wide range of resources or packages.

Python also offers a very high-level web-framework, Django, that encourages rapid development, and clean and pragmatic design. It is very robust, extremely fast and secure, and also very scalable all at the same time. Organizations like Instagram, The New York Times, The Guardian, MIT, NASA, National Geographic and many more have incorporated Django into their systems.

This system would incorporate Django to maintain the server, and Python-Docs module for the word document handling.

## Abbreviations and Acronyms

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

## Units

* Use either SI (MKS) or CGS as primary units. (SI units are encouraged.) English units may be used as secondary units (in parentheses). An exception would be the use of English units as identifiers in trade, such as “3.5-inch disk drive”.
* Avoid combining SI and CGS units, such as current in amperes and magnetic field in oersteds. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity that you use in an equation.
* Do not mix complete spellings and abbreviations of units: “Wb/m2” or “webers per square meter”, not “webers/m2”. Spell out units when they appear in text: “. . . a few henries”, not “. . . a few H”.

Identify applicable funding agency here. If none, delete this text box.

* Use a zero before decimal points: “0.25”, not “.25”. Use “cm3”, not “cc”. (*bullet list*)

## Equations

The equations are an exception to the prescribed specifications of this template. You will need to determine whether or not your equation should be typed using either the Times New Roman or the Symbol font (please no other font). To create multileveled equations, it may be necessary to treat the equation as a graphic and insert it into the text after your paper is styled.

Number equations consecutively. Equation numbers, within parentheses, are to position flush right, as in (1), using a right tab stop. To make your equations more compact, you may use the solidus ( / ), the exp function, or appropriate exponents. Italicize Roman symbols for quantities and variables, but not Greek symbols. Use a long dash rather than a hyphen for a minus sign. Punctuate equations with commas or periods when they are part of a sentence, as in:

*a**b* 

Note that the equation is centered using a center tab stop. Be sure that the symbols in your equation have been defined before or immediately following the equation. Use “(1)”, not “Eq. (1)” or “equation (1)”, except at the beginning of a sentence: “Equation (1) is . . .”

## Some Common Mistakes

* The word “data” is plural, not singular.
* The subscript for the permeability of vacuum **0, and other common scientific constants, is zero with subscript formatting, not a lowercase letter “o”.
* In American English, commas, semicolons, periods, question and exclamation marks are located within quotation marks only when a complete thought or name is cited, such as a title or full quotation. When quotation marks are used, instead of a bold or italic typeface, to highlight a word or phrase, punctuation should appear outside of the quotation marks. A parenthetical phrase or statement at the end of a sentence is punctuated outside of the closing parenthesis (like this). (A parenthetical sentence is punctuated within the parentheses.)
* A graph within a graph is an “inset”, not an “insert”. The word alternatively is preferred to the word “alternately” (unless you really mean something that alternates).
* Do not use the word “essentially” to mean “approximately” or “effectively”.
* In your paper title, if the words “that uses” can accurately replace the word “using”, capitalize the “u”; if not, keep using lower-cased.
* Be aware of the different meanings of the homophones “affect” and “effect”, “complement” and “compliment”, “discreet” and “discrete”, “principal” and “principle”.
* Do not confuse “imply” and “infer”.
* The prefix “non” is not a word; it should be joined to the word it modifies, usually without a hyphen.
* There is no period after the “et” in the Latin abbreviation “et al.”.
* The abbreviation “i.e.” means “that is”, and the abbreviation “e.g.” means “for example”.

An excellent style manual for science writers is [7].

# Using the Template

After the text edit has been completed, the paper is ready for the template. Duplicate the template file by using the Save As command, and use the naming convention prescribed by your conference for the name of your paper. In this newly created file, highlight all of the contents and import your prepared text file. You are now ready to style your paper; use the scroll down window on the left of the MS Word Formatting toolbar.

## Authors and Affiliations

**The template is designed for, but not limited to, six authors.** A minimum of one author is required for all conference articles. Author names should be listed starting from left to right and then moving down to the next line. This is the author sequence that will be used in future citations and by indexing services. Names should not be listed in columns nor group by affiliation. Please keep your affiliations as succinct as possible (for example, do not differentiate among departments of the same organization).

### For papers with more than six authors: Add author names horizontally, moving to a third row if needed for more than 8 authors.

### For papers with less than six authors: To change the default, adjust the template as follows.

#### Selection: Highlight all author and affiliation lines.

#### Change number of columns: Select the Columns icon from the MS Word Standard toolbar and then select the correct number of columns from the selection palette.

#### Deletion: Delete the author and affiliation lines for the extra authors.

## Identify the Headings

Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

Component heads identify the different components of your paper and are not topically subordinate to each other. Examples include Acknowledgments and References and, for these, the correct style to use is “Heading 5”. Use “figure caption” for your Figure captions, and “table head” for your table title. Run-in heads, such as “Abstract”, will require you to apply a style (in this case, italic) in addition to the style provided by the drop down menu to differentiate the head from the text.

Text heads organize the topics on a relational, hierarchical basis. For example, the paper title is the primary text head because all subsequent material relates and elaborates on this one topic. If there are two or more sub-topics, the next level head (uppercase Roman numerals) should be used and, conversely, if there are not at least two sub-topics, then no subheads should be introduced. Styles named “Heading 1”, “Heading 2”, “Heading 3”, and “Heading 4” are prescribed.

## Figures and Tables

#### Positioning Figures and Tables: Place figures and tables at the top and bottom of columns. Avoid placing them in the middle of columns. Large figures and tables may span across both columns. Figure captions should be below the figures; table heads should appear above the tables. Insert figures and tables after they are cited in the text. Use the abbreviation “Fig. 1”, even at the beginning of a sentence.

1. Table Type Styles

| Table Head | Table Column Head | | |
| --- | --- | --- | --- |
| Table column subhead | Subhead | Subhead |
| copy | More table copya |  |  |

1. Sample of a Table footnote. (*Table footnote*)
2. Example of a figure caption. (*figure caption*)

Figure Labels: Use 8 point Times New Roman for Figure labels. Use words rather than symbols or abbreviations when writing Figure axis labels to avoid confusing the reader. As an example, write the quantity “Magnetization”, or “Magnetization, M”, not just “M”. If including units in the label, present them within parentheses. Do not label axes only with units. In the example, write “Magnetization (A/m)” or “Magnetization {A[m(1)]}”, not just “A/m”. Do not label axes with a ratio of quantities and units. For example, write “Temperature (K)”, not “Temperature/K”.

##### Acknowledgment *(Heading 5)*

The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g”. Avoid the stilted expression “one of us (R. B. G.) thanks ...”. Instead, try “R. B. G. thanks...”. Put sponsor acknowledgments in the unnumbered footnote on the first page.

##### References

The template will number citations consecutively within brackets [1]. The sentence punctuation follows the bracket [2]. Refer simply to the reference number, as in [3]—do not use “Ref. [3]” or “reference [3]” except at the beginning of a sentence: “Reference [3] was the first ...”

Number footnotes separately in superscripts. Place the actual footnote at the bottom of the column in which it was cited. Do not put footnotes in the abstract or reference list. Use letters for table footnotes.

Unless there are six authors or more give all authors’ names; do not use “et al.”. Papers that have not been published, even if they have been submitted for publication, should be cited as “unpublished” [4]. Papers that have been accepted for publication should be cited as “in press” [5]. Capitalize only the first word in a paper title, except for proper nouns and element symbols.

For papers published in translation journals, please give the English citation first, followed by the original foreign-language citation [6].

1. G. Eason, B. Noble, and I. N. Sneddon, “On certain integrals of Lipschitz-Hankel type involving products of Bessel functions,” Phil. Trans. Roy. Soc. London, vol. A247, pp. 529–551, April 1955. *(references)*
2. J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68–73.
3. I. S. Jacobs and C. P. Bean, “Fine particles, thin films and exchange anisotropy,” in Magnetism, vol. III, G. T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350.
4. K. Elissa, “Title of paper if known,” unpublished.
5. R. Nicole, “Title of paper with only first word capitalized,” J. Name Stand. Abbrev., in press.
6. Y. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, “Electron spectroscopy studies on magneto-optical media and plastic substrate interface,” IEEE Transl. J. Magn. Japan, vol. 2, pp. 740–741, August 1987 [Digests 9th Annual Conf. Magnetics Japan, p. 301, 1982].
7. M. Young, The Technical Writer’s Handbook. Mill Valley, CA: University Science, 1989.

We suggest that you use a text box to insert a graphic (which is ideally a 300 dpi TIFF or EPS file, with all fonts embedded) because, in an MSW document, this method is somewhat more stable than directly inserting a picture.

To have non-visible rules on your frame, use the MSWord “Format” pull-down menu, select Text Box > Colors and Lines to choose No Fill and No Line.