

REBUILT

RESULT 3 – A1 – Best Practice “University of the Aegean Paperless Office”

Company Name:	University of the Aegean
Professional sector and company size	Higher Education Institute – Large (EU definition, ISSN 2443-8219)
Need/problem/challenge addressed	Reduction of consumables (A4 printing paper) and reduction of transportation needs for tangible goods (mail and packages). Reduction of office supplies and consumables. Increase in personnel productivity. Streamlining and increase in the efficiency of all administrative procedures.
Short presentation of the company:	The University of the Aegean is a public, multi-campus university located in the islands of Lesbos, Chios, Samos, Rhodes, Syros and Lemnos, in Greece. It is a Research University with 18 undergraduate programs, many graduate programs, research activities, and international collaborations in various fields of study. It has over 10000 undergraduate and graduate students, over 500 PhD candidates and approx. 1000 faculty members and administrative personnel.
Initial Process and CO₂ Emission Profile (tools, methodologies, theories, references):	<p>In the past, all administrative documents within the University were printed and distributed in physical form, using A4 papers. Tons of paper were used each year in all academic units for various purposes.</p> <p>The carbon footprint of a standard (80gr) sheet of office paper (A4) is typically between 4.19 and 4.74 gr of CO₂ equivalent (Dias & Arroja, 2012). Of course, creation and management of digital copies also has a cost in terms of resources related to the introduction and management of the necessary information systems. However, the use of resources by digital systems and the corresponding carbon footprint is significantly lower compared to using physical paper. In a study conducted by Tenhunen and Penttinen (2010) it was estimated that when a process using paper is digitalized, carbon footprint is reduced by approximately 63%. In many cases, the actual carbon footprint difference can be significantly higher, since printed paper uses additional resources related to the movements of the paper itself or the resources, including movements, of</p>

the people who are creating or using the paper copies. At an extreme, carbon footprint of printed material can be up to 80 times higher (Willemson & Krips, 2023).
 The following diagram 1 describes the previous procedure involving use of physical copies of each document, printed in A4 paper and distributed to various recipients.

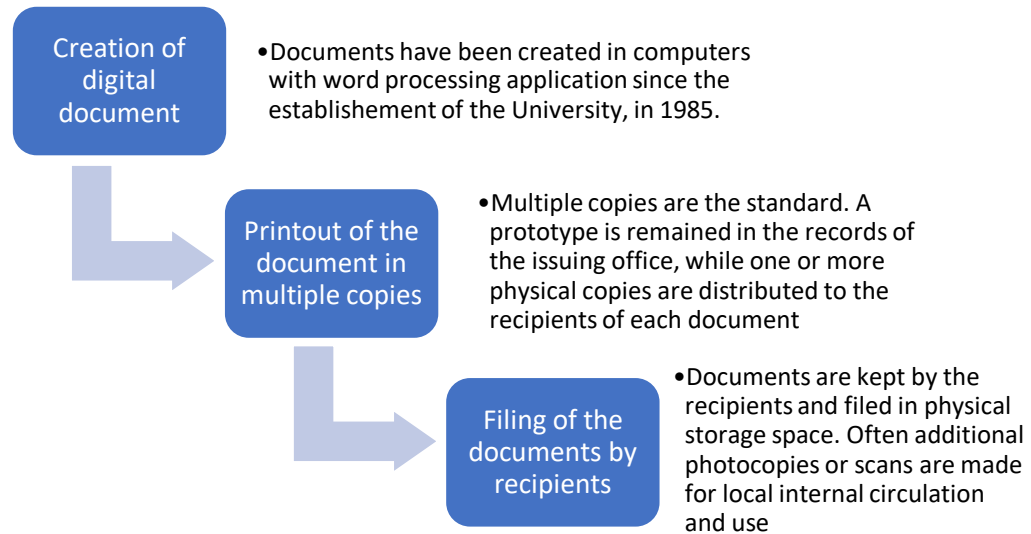


Diagram 1. The previous practice of using printed A4 documents

Methodologies and References:

Dias, A. C., & Arroja, L. (2012). Comparison of methodologies for estimating the carbon footprint—case study of office paper. *Journal of Cleaner Production*, 24, 30-35.

Tenhunen, M. & Penttinen, E. (2010), "Assessing the Carbon Footprint of Paper vs. Electronic Invoicing". *ACIS 2010 Proceedings*. 95. <https://aisel.aisnet.org/acis2010/95>

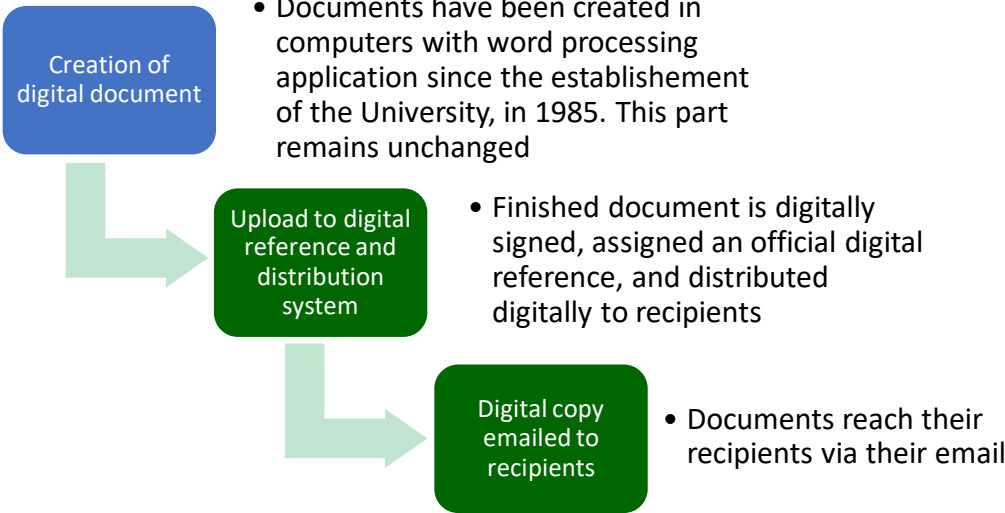
Willemson, J., & Krips, K. (2023, September). Estimating Carbon Footprint of Paper and Internet Voting. In *International Joint Conference on Electronic Voting* (pp. 140-155). Cham: Springer Nature Switzerland.

Strategic Decision of the company.

The institution decided to change its practices and pursue a policy of paperless office. The reengineering would affect the following procedures:

- a) Storage of documents in digital and not in physical format in almost all cases
- b) Use of digital copies and elimination of printing and using physical copies in almost all cases

	<ul style="list-style-type: none"> c) Digital distribution of copies to recipients and elimination of need to distribute and mail physical copies individually or in bulk d) Digitization of the official document reference procedure e) Use of digital signatures in all official documents issued by any office of the Institution
<p>Process reengineering on selected waste (resources, methodologies, tools):</p>	<p>The implementation of the paperless office policy resulted in several changes that were made in the internal processes to adapt to the new re-engineered digital procedures:</p> <ul style="list-style-type: none"> a) While the digital documents are still created locally, they are now uploaded to a central digital repository where they are formalized and given a central reference number. b) This use of a central digital service has eliminated the need for local protocol offices and procedures that were used to provide an official reference number on each document, including manual recording of the topic and other details of the document in a catalog book, where the document main info was inserted as either an incoming or outgoing document. This procedure has now been automated and the reference number is assigned by the system. c) Digital signatures are applied to the documents, replacing physical signatures and official stamps d) With the exception of specific administrative documents, no physical copies are stored in the records of the issuing office. e) The distribution of the copies is no longer done by printing or photocopying an additional copy for each recipient and then sending the copies by internal or external mail. Instead, they are distributed digitally and each recipient receives a notification and a digital copy in his/her email. <p>The re-engineered procedure is described in the following diagram 2:</p>

	 <ul style="list-style-type: none"> • Documents have been created in computers with word processing application since the establishment of the University, in 1985. This part remains unchanged • Finished document is digitally signed, assigned an official digital reference, and distributed digitally to recipients • Documents reach their recipients via their email <p>Diagram 2. The re-engineered procedure for paperless office</p>
<p>Re-engineering outcome and results.</p> <p>Emission profile improvement and other success evidence:</p>	<p>In the case of the University of the Aegean, the use of a digital document system has resulted in a reduction of printed copies of A4 paper of approximately 570.000 pages annually. Several factors affect the actual number of A4 sheets, such as the fluctuations in the average size of a document (i.e. how many pages and odd or even number of them), the distribution schema (i.e., the physical document recipients), the frequency of double-sided printing or copying, and others. Taking into account the impact of such factors, the estimated total consumption of physical A4 paper sheets - before the introduction of the digital document system - is estimated to be approximately 480.000 pages of standard 80gr A4 paper.</p> <p>The total carbon footprint of this number of paper copies is a minimum of 2.1 tons of CO₂ equivalent, considering only the paper itself and not any other resources used in the physical handling and utilization of the paper copies. In reality, the actual environmental impact will be much higher than this very conservative estimation. However, no data was available to estimate accurately the savings and the waste reduction regarding reduced need for mail services, storage space, time spent by employees for movements, getting reference number, reference books, mailing etc. It is therefore argued that based on this real-world example, the switch to a digital information system replacing conventional printed documents, can have a significant measurable environmental impact.</p>

Please identify the sustainability goals (SDGs) and the specific targets achieved in the described case:	<p>Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (targets: sustainable economic growth; diversify, innovate and upgrade for economic productivity; improve resource efficiency in consumption and production)</p> <p>Goal 9: Industry, Innovation and Infrastructure (targets: upgrade all industries and infrastructures for sustainability; enhance research and upgrade industrial technologies)</p> <p>Goal 12: Responsible consumption and production (targets: achieve the sustainable management and efficient use of natural resources; encourage companies to adopt sustainable practices)</p>
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