

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MASTERCARD INCORPORATED and MASTERCARD INTERNATIONAL
INCORPORATED,

Petitioners

v.

OV LOOP, INC.,

Patent Owner

Patent No. 10,032,171

Inter Partes Review Nos.

IPR2023-01289

IPR2023-01290

DECLARATION OF SYLVIA HALL-ELLIS, PH.D.

I. INTRODUCTION

1. My name is Sylvia D. Hall-Ellis. I have been retained as an expert on behalf of Mastercard Incorporated and Mastercard International Incorporated (“Petitioner”).

2. I have written this report on behalf of Petitioner to provide my expert opinion regarding the authenticity and public availability of several publications. My report sets forth my opinions in detail and provides the basis for my opinions regarding the public availability of these publications.

3. I reserve the right to supplement or amend my opinions, and bases for them, in response any additional evidence, testimony, discovery, argument, and/or other additional information that may be provided to me after the date of this report.

4. I am being compensated for my time spent working on this matter at my normal consulting rate of \$350 per hour, plus reimbursement for any additional reasonable expenses. My compensation is not in any way tied to the content of this report, the substance of my opinions, or the outcome of this litigation. I have no other interests in this proceeding or with any of the parties.

5. All of the materials that I considered are discussed explicitly in this declaration.

II. QUALIFICATIONS

6. I am currently an Adjunct Professor in the School of Information at San José State University. I obtained a Master of Library Science from the University of North Texas in 1972 and a Ph.D. in Library Science from the University of Pittsburgh in 1985. Over the last 50-plus years, I have held various positions in the field of library and information resources. I was first employed as a librarian in 1966 and have been involved in the field of library sciences since, holding numerous positions.

7. I am a member of the American Library Association (ALA) and its Association for Library Collections & Technical Services (ALCTS) Division, and I served on the Committee on Cataloging: Resource and Description (which wrote the new cataloging rules) and as the chair of the Committee for Education and Training of Catalogers and the Competencies and Education for a Career in Cataloging Interest Group. I also served as the Chair of the ALCTS Division's Task Force on Competencies and Education for a Career in Cataloging. Additionally, I have served as the Chair for the ALA Office of Diversity's Committee on Diversity, as a member of the REFORMA National Board of Directors, as a member of the Editorial Board for the ALCTS premier cataloging journal, *Library Resources and Technical Services*, as a Co-Chair of the Library

Research Round Table (LRRT) for the American Library Association, and as a member of the LRRT Nominating Committee.

8. I have also given over one hundred presentations in the field, including several on library cataloging systems and Machine-Readable Cataloging (“MARC”) standards. My current research interests include library cataloging systems, metadata, and organization of electronic resources.

9. My full curriculum vitae is attached hereto as Exhibit 1033.

III. LIBRARY CATALOGING PRACTICES

A. MARC RECORDS AND THE ONLINE LIBRARY CATALOG

10. I am fully familiar with the library cataloging standard known as the MARC standard, which is an industry-wide standard method of storing and organizing library catalog information.¹ MARC was first developed in the 1960s by the Library of Congress. A MARC-compatible library is one that has a catalog consisting of individual MARC records for each of its items. Today, MARC is the primary communications protocol for the transfer and storage of bibliographic metadata in libraries.

11. MARC is a framework into which descriptive bibliographic data are transcribed to interact with the software in online library catalogs to provide access

¹ The full text of the standard is available from the Library of Congress at <http://www.loc.gov/marc/bibliographic/> (last visited July 5, 2023).

to books, journals, and other resources in the collection. The bibliographic data provide points of access and can be searched by a person of ordinary skill in the art at the time of the invention (“POSITA,” see paragraphs 39-42 below) to identify and obtain resources in the library collection. An information seeker (or POSITA) can search a local online library catalog or the holdings of a group of libraries in a state or region or in the global catalog WorldCat.

12. MARC records are not designed for public viewing. Although a significant number of libraries provide access to the MARC version of a bibliographic record, the public display is designed to show information in a succinct manner that is quickly understood and useful to the information seeker. Libraries determine the default search for the online catalog to make the entry of search terms efficient and result in a successful search. Information seekers can enter a keyword, title, author, or standard number for the item. Libraries may also provide a search capability called “Summon” that allows the information seeker to enter known information about the item to conduct a search.

13. Since at least the early 1970s and continuing to the present day, MARC has been the primary communications protocol for the transfer and storage of bibliographic metadata in libraries.² As explained by the Library of Congress:

² A complete history of the development of MARC can be found in *MARC: Its History and Implications* by Henrietta D. Avram (Washington, DC: Library of

You could devise your own method of organizing the bibliographic information, but you would be isolating your library, limiting its options, and creating much more work for yourself. Using the MARC standard prevents duplication of work and allows libraries to better share bibliographic resources. Choosing to use MARC enables libraries to acquire cataloging data that is predictable and reliable. If a library were to develop a “home-grown” system that did not use MARC records, it would not be taking advantage of an industry-wide standard whose primary purpose is to foster communication of information.

Using the MARC standard also enables libraries to make use of commercially available library automation systems to manage library operations. Many systems are available for libraries of all sizes and are designed to work with the MARC format. Systems are maintained and improved by the vendor so that libraries can benefit from the latest advances in computer technology. The MARC standard also

Congress, 1975) and available online from the Hathi Trust (<https://babel.hathitrust.org/cgi/pt?id=mdp.39015034388556;view=1up;seq=1>; last visited July 5, 2023).

allows libraries to replace one system with another with the assurance that their data will still be compatible.

Why Is a MARC Record Necessary? LIBRARY OF CONGRESS.³

14. Thus, almost every major library in the world is MARC-compatible. See, e.g., *MARC Frequently Asked Questions (FAQ)*, LIBRARY OF CONGRESS.⁴ (“MARC is the acronym for MACHine-Readable Cataloging. It defines a data format that emerged from a Library of Congress-led initiative that began fifty years ago. It provides the mechanism by which computers exchange, use, and interpret bibliographic information, and its data elements make up the foundation of most library catalogs used today.”). MARC is the ANSI/NISO Z39.2-1994 standard (reaffirmed in 2016) for Information Interchange Format. The full text of the standard is available from the Library of Congress.⁵

15. Examining the MARC records for a specific item reveals the comprehensive data transcribed about a particular item at the time that cataloging and classification occurred. In addition to the creator, title, subjects, and standard numbers, additional information may provide additional and relevant data depending on the type of resource. Understanding the full extent of bibliographic

³ <http://www.loc.gov/marc/umb/um01to06.html#part2>

⁴ <https://www.loc.gov/marc/faq.html>

⁵ <http://www.loc.gov/marc/bibliographic/>

data for an item and the points of access associated with it provides essential information that can be used to determine the indexing and public availability for documents described in this declaration.

B. MARC RECORDS

16. A MARC record comprises several fields, each of which contains specific data about the work. Each field is identified by a standardized, unique, three-digit code corresponding to the type of data that follow. For example, a work's title is recorded in Field 245; the primary author of the work is transcribed in Field 100; an item's International Standard Book Number ("ISBN") consisting of ten or thirteen digits is transcribed in Field 020; an item's International Standard Serial Number ("ISSN") is transcribed in Field 022; the Library of Congress classification notation is recorded in Field 050; and the publication date is recorded in Field 260 under the subfield "c." If a work is a periodical, then its publication frequency is recorded in Field 310, and the publication dates (e.g., the first and last publication) are recorded in Field 362, which is also referred to as the enumeration/chronology field.⁶

17. The library that created the record is recorded in Field 040 in subfield "a" with a unique library code. When viewing the MARC record online via Online Computer Library Center's ("OCLC") bibliographic database, hovering over this

⁶ <http://www.loc.gov/marc/bibliographic/bd3xx.html>

code with the mouse reveals the full name of the library. I used this method of “mousing over” the library codes in the OCLC database to identify the originating library for the MARC records discussed in this Declaration. Where this “mouse over” option was not available, I consulted the Directory of OCLC Libraries to identify the institution that created the MARC record.⁷

18. MARC records also include several fields that include subject matter classification information. An overview of MARC record fields is available through the Library of Congress.⁸ For example, 6XX fields are termed “Subject Access Fields.”⁹ Among these, for example, is the 650 field; this is the “Subject Added Entry – Topical Term” field.¹⁰ The 650 field is a “[s]ubject added entry in which the entry element is a topical term.” These entries “are assigned to a bibliographic record to provide access according to generally accepted thesaurus-building rules (e.g., *Library of Congress Subject Headings* (LCSH), *Medical Subject Headings* (MeSH)).” *Id.* Further, MARC records include call numbers, which themselves include a classification number. For example, the 050 field is the “Library of Congress Call Number.”¹¹ A defined portion of the Library of

⁷ <https://www.oclc.org/en/contacts/libraries.html>

⁸ <http://www.loc.gov/marc/bibliographic/>

⁹ <http://www.loc.gov/marc/bibliographic/bd6xx.html>

¹⁰ <http://www.loc.gov/marc/bibliographic/bd650.html>

¹¹ <http://www.loc.gov/marc/bibliographic/bd050.html>

Congress Call (LCC) Number is the classification number, and “source of the classification number is *Library of Congress Classification* and the *LC Classification-Additions and Changes*.” Thus, included in the 050 field is a subject matter classification. Further, the 082 field is the “Dewey Decimal Call Number.”¹² A defined portion of the Dewey Decimal Call (DDC) Number is the classification number, and “source of the classification number is the *Dewey Decimal Classification and Relative Index*.” Thus, included in the 082 field is a subject matter classification. Each item in a library has a single classification number. A library selects a classification scheme (e.g., the Library of Congress classification scheme just described or a similar scheme such as the Dewey Decimal classification scheme) and uses it consistently. When the Library of Congress assigns the LCC classification number, it appears as part of the 050 field. When the Library of Congress assigns the DDC classification number, it appears as part of the 082 field. If a local library assigns the classification number, it appears in a 090 field. In either scenario, the MARC record includes a classification number that represents a subject matter classification.

C. OCLC

19. The OCLC was created “to establish, maintain and operate a computerized library network and to promote the evolution of library use, of

¹² <http://www.loc.gov/marc/bibliographic/bd082.html>

libraries themselves, and of librarianship, and to provide processes and products for the benefit of library users and libraries, including such objectives as increasing availability of library resources to individual library patrons and reducing the rate of rise of library per-unit costs, all for the fundamental public purpose of furthering ease of access to and use of the ever-expanding body of worldwide scientific, literary and educational knowledge and information.”¹³ Among other services, OCLC and its members are responsible for maintaining the WorldCat database (<http://www.worldcat.org/>), used by independent and institutional libraries throughout the world.

20. OCLC also provides its members online access to MARC records through its OCLC bibliographic database. When an OCLC member institution acquires a work, it creates a MARC record for this work in its computer catalog system in the ordinary course of its business. MARC records created at the Library of Congress are tape-loaded into the OCLC database through a subscription to MARC Distribution Services daily or weekly. Once the MARC record is created by a cataloger at an OCLC member institution or is tape-loaded from the Library of Congress, the MARC record is then made available to any other OCLC

¹³ Third Article, Amended Articles of Incorporation of OCLC Online Computer Library Center, Incorporated (available at <https://www.oclc.org/content/dam/oclc/membership/articles-of-incorporation.pdf>).

members online, and therefore made available to the public. Accordingly, once the MARC record is created by a cataloger at an OCLC member institution or is tape-loaded from the Library of Congress or another library anywhere in the world, any publication corresponding to the MARC record has been cataloged and indexed according to its subject matter such that a person interested in that subject matter could, with reasonable diligence, locate and access the publication through any library with access to the OCLC bibliographic database or through the Library of Congress.

21. When an OCLC member institution creates a new MARC record, OCLC automatically supplies the date of creation for that record. The date of creation for the MARC record appears in the fixed Field (008), characters 00 through 05. The MARC record creation date reflects the date on which, or shortly after which, the item was first acquired or cataloged. Initially, Field 005 of the MARC record is automatically populated with the date the MARC record was created in year, month, day format (YYYYMMDD) (some of the newer library catalog systems also include hour, minute, second (HHMMSS)). Thereafter, the library's computer system may automatically update the date in Field 005 every time the library updates the MARC record (*e.g.*, to reflect that an item has been moved to a different shelving location within the library). Field 005 is visible when viewing a MARC record via an appropriate computerized interface, but when a

MARC record is printed to hardcopy, no “005” label appears. The initial Field 005 date (*i.e.*, the date the MARC record was created) does appear, however, next to the label “Entered.”¹⁴ The date upon which the most recent update to Field 005 occurred also appears, next to the label “Replaced.” Thus, when an item’s MARC record has been printed to hardcopy—as is the case with the MARC attachments to this Declaration—the date reflected next to the label “Entered” is necessarily on or after the date the library first cataloged and indexed the underlying item.

22. Once one library has cataloged and indexed a publication by creating a MARC record for that publication, other libraries that receive the publication do not create additional MARC records—the other libraries instead rely on the original MARC record. They may update or revise the MARC record to ensure accuracy, but they do not replace or duplicate it. This practice does more than save libraries from duplicating labor. It also enhances the accuracy of MARC records. Further, it allows librarians around the world to know that a particular MARC record is authoritative (in contrast, a hypothetical system wherein duplicative records were created would result in confusion as to which record is authoritative).

23. Catalogers can create MARC records for all types of print, online, and

¹⁴ Field 005 is visible when viewing a MARC record via an appropriate computerized interface. But when a MARC record is printed directly to hardcopy from the OCLC database, the “005” label is not shown. The date in the 005 field instead appears next to the label “Replaced.”

digital resources. The date of creation of the MARC record by a cataloger at an OCLC member institution reflects when the underlying item is accessible to the public. Upwards of two-thirds to three-quarters of book sales and magazine subscriptions to libraries come from a jobber or wholesaler for online and print resources. These resellers make it their business to provide items to their customers as fast as possible, often providing turnaround times of only a single day after publication. Libraries purchase a significant portion of the balance of their books and journals directly from publishers themselves, which provide delivery on a similarly expedited schedule. In general, libraries make these purchases throughout the year and shelve the newly received items as soon thereafter as possible to make them available to their patrons.

24. *Journals.* Catalogers can create MARC records for all types of print, online, and digital resources. For example, MARC records cover serial publications, including both serially-published monographs and journals. OCLC hosts MARC records for more than 320 million serial publications. Serial publications are those publications that have the same collective title but are intended to be continued indefinitely with enumeration such as a volume or issue number (*e.g.*, magazines, journals, etc.). In the OCLC bibliographic database, the first issue of the serial publication is typically cataloged (*i.e.*, a corresponding MARC record is created), but the date is left open-ended with the use of a

punctuation mark such as a dash. OCLC serial publication MARC records represent the entire run of the serial title. With knowledge of the first issue published, future issues can be predicted based on the information provided in the MARC record, for example in field 362. In my extensive professional experience, is it highly unusual for a library to stop collecting and shelving a serial publication prior to the end of its publication run. If a subscription to a serial publication ends its run or is cancelled before the end of its run, the library will denote that it has stopped receiving new volumes by filling in the end date in the MARC record.

25. The handling of printed journal subscriptions is shown on the cover or the first few pages of individual issues. As was the best practice among libraries, issues arrived at a central facility and were immediately received, verified as part of a subscription, checked in, and stamped or labeled with the institution's name and date. Determining that the issue was part of the library subscription ensured that the entire set of publications for the year had been received so that they could be professionally bound and retained. This process also verified that all of the published issues arrived so that the library staff did not have to request or claim an issue that did not arrive as expected. In large public libraries with branches and multi-campus libraries within academic institutions, the journals were sorted and delivered to the subscribing unit. The new issue was placed in the public area; the older issue was stored so that it remained available.

26. The foregoing process has been standard library practice longer than I have been working in the profession. I first learned the steps in the process in the late 1970s and later supervised it. Although the checking in process has become automated and now links electronically to holdings records for the MARC record for each serial title, the manual placement of a stamp or label and placing the issue in a public area has not changed for 50 years. Unless I note otherwise below in reference to a specific serial publication, it is my expert opinion that this standard protocol was followed for all of the serial publications discussed below.

27. In preparing this report, I used authoritative databases, such as the OCLC bibliographic database and the Library of Congress Online Catalog, to confirm citation details of the various publications discussed.

28. *Indexing.* A researcher may discover material relevant to his or her topic in a variety of ways. One common means of discovery is to search for relevant information in an index of periodical and other publications. Having found relevant material, the researcher will then normally obtain it online, look for it in libraries, or purchase it from a publisher, a bookstore, a document delivery service, or other provider. Sometimes, the date of a document's public accessibility will involve both indexing and library date information. However, date information for indexing entries is often unavailable. This is especially true for online indices.

29. Indexing services use a wide variety of controlled vocabularies to provide subject access and other means of discovering the content of documents. The formats in which these access terms are presented vary from service to service.

30. Online indexing services commonly provide bibliographic information, abstracts, and full-text copies of the indexed publications, along with a list of the documents cited in the indexed publication. These services also often provide lists of publications that cite a given document. A citation of a document is evidence that the document was publicly available and in use by researchers no later than the publication date of the citing document.

31. Before the widespread development of online databases to index articles in journals, magazines, conference papers, and technical reports, libraries purchased printed volumes of indices. Graduate library school education mandated that students learn about the bibliographic control of disciplines, the prominent indexing volumes, and searching strategies required to use them effectively and efficiently. Half of the courses that I studied in library school were focused on the bibliography and resources in academic disciplines.

32. Librarians consulted with information seekers to verify citations, check availability in union catalogs, printed books catalogs, the OCLC database, and make formal requests for materials (e.g., books, conference proceedings, journal articles). Requests were transmitted using Telex machines, rudimentary

email systems, and the United States Postal Service. During my career, I have performed and supervised staff who handled these resource sharing tasks.

33. A major firm known for the breadth of subjects and comprehensive treatment in the preparation of index volumes, the H. W. Wilson Company offered these reference resources since the firm was founded in 1898. The *Reader's Guide to Periodical Literature* is one of the best-known titles available from H. W. Wilson. Each volume includes a comprehensive index for 300 of the most popular and important periodicals published in the United States and Canada. Information seekers have subject access expressed in plain language terminology, author access, and cross references to find the desired results from their searches. The family of index titles included *Science & Technology Index*, *Business Periodicals*, *Applied Science & Technology Index*, *Humanities Index*, *Biological & Agricultural Index*, and *Industrial Arts Index*. These printed indices have been superseded by digital database offerings available to information seekers through Ebsco.

34. Online indexing services such as *Google Scholar*¹⁵ or *ScienceDirect*¹⁶ commonly provide bibliographic information, abstracts, and full-text copies of the indexed publications, along with a list of the documents cited in the indexed publication. These services also often provide lists of publications that cite a given

¹⁵ <https://scholar.google.com/>

¹⁶ <https://www.sciencedirect.com/>

document.

35. A citation of a document by another is evidence that the document was publicly available and in use no later than the publication date of the citing document.

IV. PRELIMINARIES

36. *Scope of this declaration.* I am not an attorney and will not offer opinions on the law. I am, however, rendering my expert opinion on the authenticity of the documents referenced herein and on when and how each of these documents was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, could have located the documents before on or around the listed dates of their respective publications below.

37. I am informed by counsel that a printed publication qualifies as publicly accessible as of the date it was disseminated or otherwise made available such that a person interested in and ordinarily skilled in the relevant subject matter could locate it through the exercise of ordinary diligence.

38. While I understand that the determination of public accessibility under the foregoing standard rests on a case-by-case analysis of the facts particular to an individual publication, I also understand that a printed publication is rendered “publicly accessible” if it is cataloged and indexed by a library such that a person

interested in the relevant subject matter could locate it (*i.e.*, I understand that cataloging and indexing by a library is sufficient, though there are other ways that a printed publication may qualify as publicly accessible). One manner of sufficient indexing is indexing according to subject matter category. I understand that the cataloging and indexing by a single library of a single instance of a particular printed publication is sufficient, even if the single library is in a foreign country. I understand that, even if access to a library is restricted, a printed publication that has been cataloged and indexed therein is publicly accessible so long as a presumption is raised that the portion of the public concerned with the relevant subject matter would know of the printed publication. I also understand that the cataloging and indexing of information that would guide a person interested in the relevant subject matter to the printed publication, such as the cataloging and indexing of an abstract for the printed publication, is sufficient to render the printed publication publicly accessible.

39. I understand that routine business practices, such as general library cataloging and indexing practices, can be used to establish an approximate date on which a printed publication became publicly accessible.

40. *Persons of ordinary skill in the art.* I am told by counsel that the subject matter of this proceeding generally relates to the authorization and payment methods on mobile devices.

41. I have been informed by counsel that a “person of ordinary skill in the art at the time of the inventions” is a hypothetical person who is presumed to be familiar with the relevant field and its literature at the time of the inventions. This hypothetical person is also a person of ordinary creativity, capable of understanding the scientific principles applicable to the pertinent field.

42. I am told by counsel that persons of ordinary skill in this subject matter or art would have had a Bachelor’s degree in Electrical Engineering or Computer Engineering or equivalent knowledge with sufficient mathematical background to understand basic cryptographic techniques, and with two to four years of academic or industry experience in payment systems, and that additional education could compensate for less practical experience and vice versa.

43. It is my opinion that such a person would have been engaged in research, learning through study and practice in the field and possibly through formal instruction the bibliographic resources relevant to his or her research. In the 2011 timeframe, such a person would have had access to a vast array of long-established print resources in the area of payment systems.

V. DOCUMENT 1: EXHIBIT 1034 (“MEYER”)

44. Exhibit 1034 is a true and correct excerpt from a book titled *Cryptography: A Guide for the Design and Implementation of Cryptographic Systems: A Guide for the Design and Implementation of Secure Systems* by Carl H.

Meyer and Stephen M. Matyas (hereafter “Meyer”) and issued by John Wiley and Sons with a 1982 copyright date. The excerpt is Section Three — Principles of Fraud Prevention (pages 454-463) from Chapter 10, “Applying Cryptography to Pin-Based Electronic Funds Transfer System.” Exhibit 1034 as filed in this proceeding is a true and correct copy of the excerpt from the Meyer book. The text of Exhibit 1034 is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1034 was found within the custody of a library – a place where, if authentic, a copy of this book would likely be. Exhibit 1034 is a true and correct copy in a condition that creates no suspicion about its authenticity.

45. Attached hereto as Attachment 1A is a true and correct copy of the MARC record for this book from the University of Wisconsin – Madison Libraries. Library ownership is indicated by the presence of the library’s code (“uwmadisondb”) in the third field 035. I personally identified and retrieved the library catalog record which is Attachment 1A.

46. Based on finding a print copy of Exhibit 1034 in the University of Wisconsin – Madison Libraries and MARC record in its online library catalog attached as Attachment 1A, it is my opinion that the book titled *Cryptography: A Guide for the Design and Implementation of Cryptographic Systems: A Guide for*

the Design and Implementation of Secure Systems (Exhibit 1034) was created using a Library of Congress MARC record that was created on February 10, 1982, as part of the Cataloging in Publication (CIP) Program (see paragraph 45).

47. Attachment 1A further includes an entry in field 050 (“Z103 \$b .M55 1982”), a subject matter classification number consistent with the Library of Congress classification system and an entry in field 082 (“001.54/36”), a subject matter classification number consistent with the Dewey Decimal classification system. Attachment 1A further includes a descriptor term reading “Cryptography \$v Handbooks, manuals, etc.” (see Attachment 1B, Library of Congress subject heading sh85034453 and Attachment 1C, Library of Congress subject heading sh96005639) in the 650 field. Thus, as of its cataloging, the Meyer book (Exhibit 1034), which is the publication corresponding to the MARC record attached hereto as Attachment 1A, was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entry.

48. Attached hereto as Attachment 1D is a true and correct copy of the MARC record for the book titled *Cryptography: A Guide for the Design and Implementation of Cryptographic Systems: A Guide for the Design and Implementation of Secure Systems* by Meyer (Exhibit 1034) obtained from the OCLC bibliographic database. I personally identified and retrieved the MARC

record that is Attachment 1D. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 1D, that library code is “DLC,” which means that the MARC record for this book was created at the Library of Congress. The presence of CIP data on the copyright page of Exhibit 1034 indicates that the Meyer book was cataloged as part of the CIP Program.¹⁷ A cataloger prepares basic information about the forthcoming book which is included on the verso of the title page (also called the copyright page). The information is provided to save time needed for the cataloging process at the library after the book is purchased. The CIP data includes the author (field 100), title and subtitle (field 245), ISBN (field 022), suggested subject headings (field 650), classification numbers for the Library of Congress classification number (field 050), and the Dewey Decimal classification number (field 082). These data elements are included in the MARC record that the Library of Congress contributes to the OCLC bibliographic database. As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the Library of Congress created OCLC record number 8283178 on February 10, 1982, as shown in the “Entered” field (“19820210”). The library continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to Attachment 1D occurred on May 6, 2022, as shown in the “Replaced” field

¹⁷ <https://www.loc.gov/publish/cip/>

(“20220506”). I personally identified and retrieved the MARC record that is Attachment 1D.

49. Attachment 1D further includes an entry in field 050 (“Z103 \$b .M55 1982”)—as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 082 (“001.6”), a subject matter consistent with the Dewey Decimal classification system. Attachment 1D further includes a descriptor reading “Cryptography \$v Handbooks, manuals, etc.” (see Attachment 1B, Library of Congress subject heading sh85034453 and Attachment 1C, Library of Congress subject heading sh96005639) in the 650 field. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 1D was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entry. Further, as of February 10, 1982, the MARC record attached hereto as Attachment 1D was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

50. Further supporting my opinion that Exhibit 1034 was publicly accessible to ordinarily skilled and interested researchers in the field is the fact that the book titled *Cryptography: A Guide for the Design and Implementation of Cryptographic Systems: A Guide for the Design and Implementation of Secure Systems* was registered with the U. S. Copyright Office as item TX0001015082 on November 2, 1982, and indicated a publication date of August 12, 1982 (see Attachment 1E, U. S. Copyright Office Public Catalog). As noted above, this would have provided a POSITA with keyword searching capabilities and other tools to locate this book.

51. Attachment 1D indicates that the book titled *Cryptography: A Guide for the Design and Implementation of Cryptographic Systems: A Guide for the Design and Implementation of Secure Systems* by Meyer (Exhibit 1034) as cataloged at the Library of Congress is currently available from 543 libraries. In view of above, it is my opinion that this book was publicly available on August 12, 1982, because by that date it had been published by John Wiley and Sons, cataloged and indexed at the Library of Congress, made part of the OCLC bibliographic database, and received at the University of Wisconsin – Madison Libraries. For these reasons, it is my opinion that Exhibit 1034 was published and accessible to the public on or shortly after August 12, 1982.

VI. DOCUMENT 2: EXHIBIT 1035 (“CONGRESS”)

52. Exhibit 1035 is a true and correct excerpt from a book titled *Protecting Privacy in Computerized Medical Information* prepared in the U.S. Congress, Office of Technology Assessment of the U. S. Congress (hereafter “Congress”) and issued by the U. S. Government Printing Office with a 1993 copyright date. The book is identified as document OTA-TCT-576 and bears a September 1993 date. The excerpt is Appendix A, “Selected Topics in Computer Security” (pages 89-100). Exhibit 1035 as filed in this proceeding is a true and correct copy of the excerpt from the Congress book. The text of Exhibit 1035 is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1035 was found within the custody of a library – a place where, if authentic, a copy of this book would likely be. Exhibit 1035 is a true and correct copy in a condition that creates no suspicion about its authenticity.

53. The Congress report can be found in the HathiTrust. Google made a digitized copy of the Congress book from the print version received and cataloged at the University of Michigan Libraries (Ann Arbor, Michigan). The MARC record in the HathiTrust online catalog reflects the creation of a bibliographic record at the University of Michigan Libraries. The Congress book was cataloged on July 7, 1997, as shown in field 008 of Attachment 2A.

54. Attached hereto as Attachment 2B is a true and correct copy of the MARC record for this book from the University of Wisconsin – Madison Libraries. Library ownership is indicated by the presence of the library’s code (“uwmadisondb”) in the fourth field 035. I personally identified and retrieved the library catalog record which is Attachment 2B.

55. Based on finding a print copy of Exhibit 1035 in the University of Wisconsin – Madison Libraries and MARC record in its online library catalog attached as Attachment 2B, it is my opinion that the book titled *Protecting Privacy in Computerized Medical Information* (Exhibit 1035) was created using a Library of Congress MARC record that was created on March 4, 1984.

56. Attachment 2B further includes an entry in field 050 (“R859.2.U5 \$b .P76 1993”), a subject matter classification number consistent with the Library of Congress classification system and an entry in field 082 (“651.504261/0285”), a subject matter classification number consistent with the Dewey Decimal classification system. Attachment 2B further includes two descriptor terms reading “Medical records \$x Access control \$z United States” (see Attachment 2C, Library of Congress subject heading sh2007008835) and “Privacy, Right of \$z United States” (see Attachment 2D, Library of Congress subject heading sh2008108965) in the 650 fields. Thus, as of its cataloging, the Congress book (Exhibit 1035), which is the publication corresponding to the MARC record

attached hereto as Attachment 2B, was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entries.

57. Attached hereto as Attachment 2E is a true and correct copy of the MARC record for the book titled *Protecting Privacy in Computerized Medical Information* (Exhibit 1035) obtained from the OCLC bibliographic database. I personally identified and retrieved the MARC record that is Attachment 2E. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 2E, that library code is “DLC,” which means that the MARC record for this book was created at the Library of Congress. As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the Library of Congress created OCLC record number 29489452 on March 4, 1994, as shown in the “Entered” field (“19940304”). The library continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to Attachment 2E occurred on July 19, 2022, as shown in the “Replaced” field (“20220719”). I personally identified and retrieved the MARC record that is Attachment 2E.

58. Attachment 2E further includes an entry in field 050 (“R859.2.U5 \$b P76 1993”)—as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to

the Dewey Decimal classification system) and an entry in field 082 (“651.5/04261/0285”), a subject matter consistent with the Dewey Decimal classification system. Attachment 2E further includes three descriptor terms reading “Medical records \$x Access control \$z United States” (see Attachment 2C, Library of Congress subject heading sh2007008835), “Privacy, Right of \$z United States” (see Attachment 2D, Library of Congress subject heading sh2008108965), and “Confidential communications” (see Attachment 2F, Library of Congress subject heading sh85030929) in the 650 fields. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 2E was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entries. Further, as of March 4, 1994, the MARC record attached hereto as Attachment 2E was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

59. Attachment 2E indicates that the book titled *Protecting Privacy in Computerized Medical Information* (Exhibit 1035) as cataloged at the Library of Congress is currently available from 110 libraries. In view of above, it is my

opinion that this book was publicly available on March 4, 1994, because by that date it had been published by the U. S. Government Printing Office, cataloged and indexed at the Library of Congress, made part of the OCLC bibliographic database, and received at the University of Wisconsin – Madison Libraries. For these reasons, it is my opinion that Exhibit 1035 was published and accessible to the public on or shortly after March 4, 1994.

VII. DOCUMENT 3: EXHIBIT 1036 (“PTO”)

60. Exhibit 1036 is a true and correct excerpt from a book titled *Technical Reference Model Version 2.0* prepared under the leadership of the Chief Information Officer in the Office of System Architecture and Engineering at the U. S. Patent and Trademark Office (hereafter “PTO”) and issued by the PTO with a 1996 copyright date. The book is identified as Version 2.0 and bears a November 1, 1996, date. The excerpt is Subchapter 4.11.1, “Data Encryption Standard (DES)” (p. 88). Exhibit 1036 as filed in this proceeding is a true and correct copy of the excerpt from the PTO book. The text of Exhibit 1036 is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1036 was found within the custody of a library – a place where, if authentic, a copy of this book would likely be. Exhibit 1036 is a true and correct copy in a condition that creates no suspicion about its authenticity.

61. The PTO document can be found in the HathiTrust. Google made a digitized copy of the PTO document book from the print version received and cataloged at the University of Michigan Libraries (Ann Arbor, Michigan). The MARC record in the HathiTrust online catalog reflects the creation of a bibliographic record at the University of Michigan Libraries (see Attachment 3A). The PTO book was cataloged on March 15, 1999, as shown in field 008 of Attachment 3A.

62. Attached hereto as Attachment 3B is a true and correct copy of the MARC record for this book from the University of Wisconsin – Madison Libraries. Library ownership is indicated by the presence of the library’s code (“GZM”) in field 049. I personally identified and retrieved the library catalog record which is Attachment 3B.

63. Based on finding a print copy of Exhibit 1036 in the University of Wisconsin – Madison Libraries and MARC record in its online library catalog attached as Attachment 3B, it is my opinion that the book titled *Technical Reference Model Version 2.0* (Exhibit 1036) was created using a MARC record that was created at the University of Michigan Libraries (Ann Arbor, Michigan) on March 15, 1999.

64. Attachment 3B further includes an entry in field 086 (“C 21.2:M 72”), a subject matter classification number consistent with the U. S. Superintendent of

Documents classification system. Attachment 3B further includes two descriptor terms reading “United States Patent and Trademark Office \$x Automation” (see Attachment 3C, Library of Congress name authority heading n79076648 and Attachment 3D, Library of Congress subject heading sh85010116) and “United States Patent and Trademark Office \$x Information services” (see Attachment 3C, Library of Congress name authority heading n79076648 and Attachment 3E, Library of Congress subject heading sh85066157) in the 610 fields. Thus, as of its cataloging, the PTO book (Exhibit 1036), which is the publication corresponding to the MARC record attached hereto as Attachment 3B, was indexed according to its subject matter by virtue of at least two independently sufficient classifications: the field 086 entry and the field 610 entries.

65. Attached hereto as Attachment 3F is a true and correct copy of the MARC record for the book titled *Technical Reference Model Version 2.0* (Exhibit 1036) obtained from the OCLC bibliographic database. I personally identified and retrieved the MARC record that is Attachment 3F. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 3F, that library code is “EYM,” which means that the MARC record for this book was created at the University of Michigan Libraries (Ann Arbor, Michigan). As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the University of Michigan Libraries created OCLC record

number 40963418 on March 15, 1999, as shown in the “Entered” field (“19990315”). The library continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to Attachment 3F occurred on August 28, 2021, as shown in the “Replaced” field (“20210828”). I personally identified and retrieved the MARC record that is Attachment 3F.

66. Attachment 3F further includes an entry in field 050 (“KF3120.Z9 \$b T43”)—as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 086 (“C 21.2:M 72”), a subject matter consistent with the U. S. Superintendent of Documents classification system. Attachment 3F further includes two descriptor terms reading “United States Patent and Trademark Office \$x Automation” (see Attachment 3C, Library of Congress name authority heading n79076648 and Attachment 3D, Library of Congress subject heading sh85010116) and “United States Patent and Trademark Office \$x Information services” (see Attachment 3C, Library of Congress name authority heading n79076648 and Attachment 3E, Library of Congress subject heading sh85066157) in the 610 fields. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 3F was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 086 entry, and the field 610 entries.

Further, as of March 15, 1999, the MARC record attached hereto as Attachment 3F was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

67. Attachment 3F indicates that the book titled *Technical Reference Model Version 2.0* (Exhibit 1036) as cataloged at the University of Michigan Libraries is currently available from 230 libraries. In view of above, it is my opinion that this book was publicly available on March 15, 1999, because by that date it had been published by the Office of System Architecture and Engineering in the U. S. Patent and Trademark Office, cataloged and indexed at the University of Michigan Libraries, made part of the OCLC bibliographic database, and received at the University of Wisconsin – Madison Libraries. For these reasons, it is my opinion that Exhibit 1036 was published and accessible to the public on or shortly after March 15, 1999.

VIII. DOCUMENT 4: EXHIBIT 1037 (“RADU”)

68. Exhibit 1037 is a true and correct set of excerpts from a book titled *Implementing Electronic Card Payment Systems* by Cristian Radu (hereafter “Radu”) and published by Artech House with a 2003 copyright date. The excerpts are Chapter 2, “Payment Card Processing, Sections 2.1, Payment Card Processing

at a Glance,” Section 2.2, “Roles Involved in Payment Card Processing” and Section 2.3, “Payment Card Brands” (pp. 9-15); Section 2.8, “Payment Network and Interchange Messages” (pp. 37-44), Section 2.9, “On-line Authorization” (pp. 45-46); and Section 2.10, “Clearing and Settlement” (pp. 47-50); Chapter 3, “Chip Migration,” Section 3.1, “A Business Case for Chip Migration” (pp. 53-55), Section 3.2, “An Overview of the Chip Card Technology” (pp. 56-69); Chapter 6, “Debit and Credit with EMV™,” Section 6.1, “Overview of the EMV™ Debit/Credit Transaction” (pp. 147-151), Section 6.9, “Authorizing Request and Response with Chip Data” (pp. 217-221), Section 6.10, “Issuer Scripts” (pp. 222-225); and, Appendix E, “Block Ciphers, Key Derivation” (pp. 405-406).

69. Exhibit 1037 as filed in this proceeding is a true and correct copies of the excerpts from the Radu book. The text of Exhibit 1037 is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1037 was found within the custody of a library – a place where, if authentic, a copy of this book would likely be. Exhibit 1037 is a true and correct copy in a condition that creates no suspicion about its authenticity.

70. Attached hereto as Attachment 4A is a true and correct copy of the MARC record for this book from the University of Wisconsin – Madison Libraries. Library ownership is indicated by the presence of the library’s code (“GZM”) in

field 049. I personally identified and retrieved the library catalog record which is Attachment 4A.

71. Based on finding a print copy of Exhibit 1037 in the University of Wisconsin – Madison Libraries and MARC record in its online library catalog attached as Attachment 4A, it is my opinion that the book titled *Implementing Electronic Card Payment Systems* (Exhibit 1037) was created using a MARC record that was created at the Library of Congress on August 14, 2002, as part of the Cataloging in Publication (CIP) Program (see paragraph 69).

72. Attachment 4A further includes an entry in field 050 (“HG1710 \$b .R33 2003”), a subject matter classification number consistent with the Library of Congress classification system and an entry in field 082 (“658.8/8”), a subject matter classification number consistent with the Dewey Decimal classification system. Attachment 4A further includes five descriptor terms reading “Electronic funds transfers” (see Attachment 4B, Library of Congress subject heading sh85042329), “Credit cards” (see Attachment 4C, Library of Congress subject heading sh85033865), “Debit cards” (see Attachment 4D, Library of Congress subject heading sh86000484), “Payment \$x Data processing” (see Attachment 4E, Library of Congress subject heading sh85098898 and Attachment 4F, Library of Congress subject heading sh85035857) and “Electromagnetic compatibility” (see Attachment 4G, Library of Congress subject heading sh85042167) in the 650

fields. Thus, as of its cataloging, the Radu book (Exhibit 1037), which is the publication corresponding to the MARC record attached hereto as Attachment 4A, was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entries.

73. Attached hereto as Attachment 4H is a true and correct copy of the MARC record for the book titled *Implementing Electronic Card Payment Systems* (Exhibit 1037) obtained from the OCLC bibliographic database. I personally identified and retrieved the MARC record that is Attachment 4H. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 4H, that library code is “DLC,” which means that the MARC record for this book was created at the Library of Congress. The presence of CIP data on the copyright page of Exhibit 1037 indicates that the Radu book was cataloged as part of the CIP Program.¹⁸ A cataloger prepares basic information about the forthcoming book which is included on the verso of the title page (also called the copyright page). The information is provided to save time needed for the cataloging process at the library after the book is purchased. The CIP data includes the author (field 100), title and subtitle (field 245), ISBN (field 022), suggested subject headings (field 650), classification numbers for the Library

¹⁸ <https://www.loc.gov/publish/cip/>

of Congress classification number (field 050), and the Dewey Decimal classification number (field 082). These data elements are included in the MARC record that the Library of Congress contributes to the OCLC bibliographic database. As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the Library of Congress created OCLC record number 50447774 on August 14, 2002, as shown in the “Entered” field (“20020814”). The library continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to Attachment 4H occurred on May 5, 2023, as shown in the “Replaced” field (“20230505”). I personally identified and retrieved the MARC record that is Attachment 4H.

74. Attachment 4H further includes an entry in field 050 (“HG1710 \$b .R33 2003”)—as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 082 (“658.8/8”), a subject matter consistent with the Dewey Decimal classification system. Attachment 4H further includes five descriptor terms reading “Electronic funds transfers” (see Attachment 4B, Library of Congress subject heading sh85042329), “Credit cards” (see Attachment 4C, Library of Congress subject heading sh85033865), “Debit cards” (see Attachment 4D, Library of Congress subject heading sh86000484), “Payment \$x Data processing” (see Attachment 4E, Library

of Congress subject heading sh85098898 and Attachment 4F, Library of Congress subject heading sh85035857) and “Electromagnetic compatibility” (see Attachment 4G, Library of Congress subject heading sh85042167) in the 650 fields. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 4H was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entries. Further, as of August 14, 2002, the MARC record attached hereto as Attachment 4H was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

75. Further supporting my opinion that Exhibit 1037 was publicly accessible to ordinarily skilled and interested researchers in the field is the fact that the book titled *Implementing Electronic Card Payment Systems* was registered with the U. S. Copyright Office as item TX0005630450 on November 13, 2002, and indicated a publication date of October 31, 2002 (see Attachment 4I, U. S. Copyright Office Public Catalog). As noted above, this would have provided a POSITA with keyword searching capabilities and other tools to locate this book.

76. Attachment 4H indicates that the book titled *Implementing Electronic*

Card Payment Systems (Exhibit 1037) as cataloged at the Library of Congress is currently available from 116 libraries. In view of above, it is my opinion that this book was publicly available on October 31, 2002, because by that date it had been published by Artech House, cataloged and indexed at the Library of Congress, made part of the OCLC bibliographic database, and received at the University of Wisconsin – Madison Libraries. For these reasons, it is my opinion that Exhibit 1037 was published and accessible to the public on or shortly after October 31, 2002.

IX. DOCUMENT 5: EXHIBIT 1038 (“HOFFSTEIN”)

77. Exhibit 1038 is a true and correct excerpt from a book titled *An Introduction to Mathematical Cryptography* by Jeffrey Hoffstein, Jill Pipher, and J. H. Silverman (hereafter “Hoffstein”) and published by Springer with a 2008 copyright date. The excerpt is Chapter 8, “Additional Topics in Cryptography, Section 8.10, Modern Symmetric Cryptosystems: DES and AES” (pp. 485-487). Exhibit 1038 as filed in this proceeding is a true and correct copy of the excerpt from the Hoffstein book. The text of Exhibit 1038 is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1038 was found within the custody of a library – a place where, if authentic, a copy of this book would likely be. Exhibit 1038 is a true and correct copy in a condition that

creates no suspicion about its authenticity.

78. Attached hereto as Attachment 5A is a true and correct copy of the MARC record for this book from the University of Wisconsin – Madison Libraries. Library ownership is indicated by the presence of the library’s code (“GZM”) in field 049. I personally identified and retrieved the library catalog record which is Attachment 5A.

79. Based on finding a print copy of Exhibit 1038 in the University of Wisconsin – Madison Libraries and MARC record in its online library catalog attached as Attachment 5A, it is my opinion that the book titled *An Introduction to Mathematical Cryptography* (Exhibit 1038) was created using a MARC record that was created at the British Library on March 25, 2008, as part of the Cataloging in Publication (CIP) Program¹⁹ (see paragraph 80).

80. Attachment 5A further includes an entry in field 050 (“QA268 \$b .H64 2008”), a subject matter classification number consistent with the Library of Congress classification system and an entry in field 082 (“652.80151”), a subject matter classification number consistent with the Dewey Decimal classification system. Attachment 5A further includes a descriptor term reading “Cryptography \$x Mathematics” (see Attachment 1B, Library of Congress subject heading sh85034453 and Attachment 5B, Library of Congress subject heading

¹⁹ <https://www.bl.uk/collection-metadata/metadata-services>

sh85082139) in the 650 field. Thus, as of its cataloging, the Hoffstein book (Exhibit 1038), which is the publication corresponding to the MARC record attached hereto as Attachment 5A, was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entry.

81. Attached hereto as Attachment 5C is a true and correct copy of the MARC record for the book titled *An Introduction to Mathematical Cryptography* (Exhibit 1038) obtained from the OCLC bibliographic database. I personally identified and retrieved the MARC record that is Attachment 5C. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 5C, that library code is “UKM,” which means that the MARC record for this book was created at the British Library. The lack of CIP data on the copyright page of Exhibit 1038 indicates that the Hoffstein book was cataloged as part of the CIP Program at the British Library.²⁰ However, the data were not printed on the copyright page. However, a cataloger prepares basic information about the forthcoming book which is included on the verso of the title page (also called the copyright page). The information is provided to save time needed for the cataloging process at the library after the book is purchased. The CIP data includes the author (field 100), title and subtitle (field 245), ISBN (field

²⁰ <https://www.bdslive.com/publishers/upload-your-metadata/>

022), suggested subject headings (field 650), classification numbers for the Library of Congress classification number (field 050), and the Dewey Decimal classification number (field 082). These data elements are included in the MARC record that the British Library contributes to the OCLC bibliographic database. As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the British Library created OCLC record number 226280654 on March 25, 2008, as shown in the “Entered” field (“20080325”). The library continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to Attachment 5C occurred on June 18, 2022, as shown in the “Replaced” field (“20220618”). I personally identified and retrieved the MARC record that is Attachment 5C.

82. Attachment 5C further includes an entry in field 050 (“QA268 \$b .H64 2008”)—as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 082 (“652.80151”), a subject matter consistent with the Dewey Decimal classification system. Attachment 5C further includes a descriptor term reading “Cryptography \$x Mathematics” (see Attachment 1B, Library of Congress subject heading sh85034453 and Attachment 5B, Library of Congress subject heading sh85082139) in the 650 field. Thus, as of its cataloging, the publication

corresponding to the MARC record attached hereto as Attachment 5C was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entry. Further, as of March 25, 2008, the MARC record attached hereto as Attachment 5C was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

83. Further supporting my opinion that Exhibit 1038 was publicly accessible to ordinarily skilled and interested researchers in the field is the fact that the book titled *An Introduction to Mathematical Cryptography* was registered with the U. S. Copyright Office as item TX0007228138 on September 19, 2008, and indicated a publication date of August 12, 2008 (see Attachment 5D, U. S. Copyright Office Public Catalog). As noted above, this would have provided a POSITA with keyword searching capabilities and other tools to locate this book.

84. Attachment 5C indicates that the book titled *An Introduction to Mathematical Cryptography* (Exhibit 1038) as cataloged at the British Library is currently available from 370 libraries. In view of above, it is my opinion that this book was publicly available on August 12, 2008, because by that date it had been published by Springer, cataloged and indexed at the British Library, made part of

the OCLC bibliographic database, and received at the University of Wisconsin – Madison Libraries. For these reasons, it is my opinion that Exhibit 1038 was published and accessible to the public on or shortly after August 12, 2008.

X. DOCUMENT 6: EXHIBIT 1039 (“RABAH”)

85. Exhibit 1039 is a copy of the journal article titled “Theory and Implementation of Data Encryption Standard: A Review” by Kefa Rabah (hereafter “Rabah”). The Rabah article was published in Volume 4, Issue 4 of the online publication *Information Technology Journal*.²¹ The Rabah article appears beginning on page 307 of this issue dated April 2005. Exhibit 1039 is a true and correct copy of the Rabah article (pages 307-325) that I understand is being submitted as an exhibit in this proceeding. Specifically, the text of the article is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. The Rabah article is also available in the digital repository *ResearchGate*.²² Exhibit 1039 is a true and correct copy in a condition that creates no suspicion about its authenticity.

86. Attached hereto as Attachment 6A is a true and correct copy of the

²¹ <https://scialert.net/archivedetails.php?issn=1812-5638&issueno=17>

²²

https://www.researchgate.net/publication/45949430_Theory_and_Implementation_of_Data_Encryption_Standard_A_Review

MARC record for the online publication *International Technology Journal* obtained from the OCLC bibliographic database. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 6A, that library code is “AEU,” which means that the MARC record for this serial was cataloged at the U. S. Army Corps of Engineers Technical Library and Information Center (St. Louis, Missouri). As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the U. S. Army Corps of Engineers Technical Library and Information Center created OCLC record number 464052358 on September 14, 2005, as shown in the “Entered” field (“20050914”). The library continues to update this MARC record and enhanced the MARC record to meet current cataloging rules. The most recent enhancement to Attachment 1A occurred on December 26, 2022, as shown in the “Replaced” field (“20221226”). I personally identified and retrieved the MARC record that is Attachment 6A. The “BLvl” entry in Attachment 6A is “s,” which indicates that the online publication *International Technology Journal* is a serial publication. Field 310 of Attachment 6A reads “Monthly, \$b <2011-.” Accordingly, the MARC record for Exhibit 1039 corresponds to the online publication *International Technology Journal* from the time the serial title adopted the current title and includes the date of the Rabah article.²³

²³ The online publication was originally titled the *Pakistan Journal of Information*

87. Attachment 6A includes three descriptors reading “Information technology \$v Periodicals” (see Attachment 6B, Library of Congress subject heading sh2008104637), “Technology \$v Periodicals” (see Attachment 6C, Library of Congress subject heading sh85133164), and “Engineering \$v Periodicals” (see Attachment 6D, Library of Congress subject heading sh85043188) in the 650 fields. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 6A was indexed according to its subject matter by virtue of the field 650 entries. As of September 14, 2005, the MARC record attached hereto as Attachment 6A was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that subscribed to the serial, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

88. Attachment 6A indicates that the online publication *International Technology Journal* as cataloged at the U. S. Army Corps of Engineers Technical Library and Information Center is currently available from 34 libraries. In view of the above, this issue of the online publication *International Technology Journal* was publicly available on or shortly after November 1, 2005, because by that date

and Technology (2002-2003) and adopted the current title in 2004.

it had been cataloged and indexed at the U. S. Army Corps of Engineers Technical Library and Information Center and made part of the OCLC bibliographic database. For these reasons, it is my opinion that Exhibit 1039 was published and accessible to the public on or shortly after November 1, 2005.

XI. DOCUMENT 7: EXHIBIT 1040 (“SCA”)

89. Exhibit 1040 is a true and correct copy of the white paper titled *Card Payments Roadmap in the United States: How Will EMV Impact the Future Payments Infrastructure?* (hereafter “SCA”) prepared by The Smart Card Alliance as publication number PC-1101 and dated February 2011.

90. The SCA white paper can be downloaded from the organization’s website.²⁴ I obtained the SCA document from its website and made the copy that is Exhibit 1040. Specifically, the text of the document titled *Card Payments Roadmap in the United States: How Will EMV Impact the Future Payments Infrastructure?* is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1040 was found within the custody of the issuing organization – a place where, if authentic, a copy of this federal document would likely be.

²⁴

https://www.securetechalliance.org/resources/pdf/Payments_Roadmap_in_the_US_020111.pdf

91. Exhibit 1040 is a true and correct copy in a condition that creates no suspicion about its authenticity. Based on the date recorded in the document, it is my opinion that the document titled *Card Payments Roadmap in the United States: How Will EMV Impact the Future Payments Infrastructure?* was available to the public by February 28, 2011, or shortly thereafter.

XII. DOCUMENT 8: EXHIBIT 1041 (“MOREA”)

92. Exhibit 1041 is a true and correct copy of the white paper titled *EMV in the U.S.: Putting It into Perspective for Merchants and Financial Institutions* prepared by Dom Morea (hereafter “Morea”) for First Data Corporation and dated 2011.

93. I entered the title of the white paper in a web browser and found the Morea white paper which can be downloaded from the Internet.²⁵ I obtained the Morea document and made the copy that is Exhibit 1041. Specifically, the text of the document titled *EMV in the U.S.: Putting It into Perspective for Merchants and Financial Institutions* is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1041 was found within the custody of the issuing organization – a place where, if authentic, a copy of this federal document

²⁵ https://smartpay.gsa.gov/sites/default/files/downloads/EMV_US_0.pdf

would likely be. Citations for related documents, reports, and URLs are included dating to September 1, 2011.

94. Exhibit 1041 is a true and correct copy in a condition that creates no suspicion about its authenticity. Based on the date recorded in the document, it is my opinion that the document titled *EMV in the U.S.: Putting It into Perspective for Merchants and Financial Institutions* was available to the public by December 31, 2011, or shortly thereafter.

XIII. SUMMARY OF OPINIONS

95. In view of the foregoing, it is my opinion that the publication described above were publicly available no later than the corresponding date listed in the table below:

Exhibit	Publication	Publicly Available No Later Than
1034	Meyer, Carl H., and Stephen M. Matyas. <i>Cryptography: A Guide for the Design and Implementation of Cryptographic Systems: A Guide for the Design and Implementation of Secure Systems</i> . New York: Wiley, [1982].	August 12, 1982
1035	U.S. Congress. Office of Technology Assessment. <i>Protecting Privacy in Computerized Medical Information</i> . OTA-TCT-576. Washington, DC: U.S. Government Printing Office, 1993.	March 4, 1994
1036	U.S. Patent and Trademark Office. <i>Technical Reference Model Version 2.0</i> . Washington, DC: Chief Information Officer, Office of System Architecture and Engineering, 1996.	March 15, 1999
1037	Radu, Cristian. <i>Implementing Electronic Card</i>	October 31, 2002

Exhibit	Publication	Publicly Available No Later Than
	<i>Payment Systems</i> . Boston, MA: Artech House, ©2003.	
1038	Hoffstein, Jeffrey, Jill Pipher, and J. H. Silverman. <i>An Introduction to Mathematical Cryptography</i> . New York; London: Springer, 2008.	August 12, 2008
1039	Rabah, Kefa. "Theory and Implementation of Data Encryption Standard: A Review." <i>Information Technology Journal</i> , vol. 4, issue 4 (April 2005): 307-325.	November 1, 2005
1040	The Smart Card Alliance. <i>Card Payments Roadmap in the United States: How Will EMV Impact the Future Payments Infrastructure?</i> Princeton Junction, NJ: Smart Card Alliance, 2011.	February 28, 2011
1041	Morea, Dom. <i>EMV in the U.S.: Putting It into Perspective for Merchants and Financial Institutions</i> . Atlanta, GA: First Data Corporation, © 2011.	December 31, 2011

96. In signing this Declaration, I recognize that the Declaration will be filed as evidence in a case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

97. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are

believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1034 of Title 18 of the United States Code.

DATED: August 10, 2023

By: *Sylvia D. Hall-Ellis*
Sylvia D. Hall-Ellis, Ph.D.

Attachment 1A

MARC Bibliographic Record

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100 1_ \$aMeyer, Carl H.

245 10 \$aCryptography :\$ba new dimension in computer data security :
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/\$cCarl H. Meyer, Stephen M. Matyas.

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264 _1 \$aNew York :\$bWiley,\$c[1982]

264 _4 \$c©1982

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338 \$avolume\$bnc\$2rdacarrier

504 \$aIncludes bibliographical references and index.

650 _0 \$aCryptography\$vHandbooks, manuals, etc.

700 1_ \$aMatyas, Stephen M.

997 \$aMARCIVE

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LCCN Permalink: <https://lcn.loc.gov/sj96005639>

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040 __ |a DLC |c DLC |d DLC

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450 __ |a Handbooks, vade-mecums, etc.

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953 __ |a xx00

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Washington, DC 20540**Library of Congress Authorities**URL: <http://authorities.loc.gov/>**Library of Congress Online Catalog**URL: <https://catalog.loc.gov/>Questions, comments, error reports: [Contact Us](#)

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084 ST 276 \$2 rvk

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084 AB 55 \$2 blsrisc

090 \$b

100 1 Meyer, Carl H., \$e author.

245 10 Cryptography : \$b a new dimension in computer data security : a guide for the design and implementation of secure systems / \$c Carl H. Meyer, Stephen M. Matyas, Cryptography Competency Center, IBM Corporation, Kingston, New York.

264 1 New York : \$b Wiley, \$c [1982].

264 4 \$c ©1982

300 xxi, 755 pages : \$b illustrations ; \$c 26 cm

336 text \$b txt \$2 rdacontent

337 unmediated \$b n \$2 rdamedia

338 volume \$b nc \$2 rdacarrier

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505 0 1. The role of cryptography in electronic data processing -- 2. Block ciphers and stream ciphers --

3. The data encryption standard -- 4. Communication security and file security using cryptography -- 5.

The host system cryptographic operations -- 6. Generation, distribution, and installation of cryptographic

keys -- 7. Incorporation of cryptography into a communications architecture -- 8. Authentication

techniques using cryptography -- 9. Digital signatures -- 10. Applying cryptography to PIN-based

electronic funds transfer systems -- 11. Applying cryptography to electronic funds transfer systems:

personal identification numbers and personal keys -- 12. Measures of secrecy for cryptographic systems.

530 Also issued online.
 540 Current Copyright Fee: GBP32.00 \$c 0. \$5 Uk
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 (OCoLC)557716381

Attachment 1E



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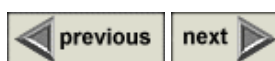
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Search Results: Displaying 1 of 1 entries



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Cryptography : a new dimension in computer data security : a guide for the...

Type of Work: Text

Registration Number / Date: TX0001015082 / 1982-11-02

Title: Cryptography : a new dimension in computer data security : a guide for the design and implementation of secure systems / Carl H. Meyer, Stephen M. Matyas.

Imprint: New York : J. Wiley, c1982.

Description: 755 p.

Copyright Claimant: John Wiley & Sons, Inc.

Date of Creation: 1981

Date of Publication: 1982-08-12

Previous Registration: Some ill. & some text prev. pub. Appl. states U. S. copyright is not claimed in any material taken from U.S. Govt. sources.

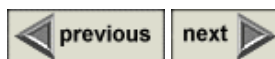
Basis of Claim: New Matter: "most of text & most ill. are new."

Variant title: Cryptography : a new dimension in computer data security

Names: [Meyer, Carl H.](#)

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088	□ □	‡a OTA-TCT-576
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260	□ □	‡a Washington, D.C. : ‡b The Office : ‡b For sale by the U.S. G.P.O., Supt. of Docs., ‡c [1993]
300	□ □	‡a viii, 157 p. : ‡b ill. ; ‡c 26 cm.
500	□ □	‡a "OTA-TCT-576"--P. [4] of cover.
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504	□ □	‡a Includes bibliographical references and index.
538	□ □	‡a Mode of access: Internet.
650	□ 2	‡a Medical Records Systems, Computerized.
650	□ 2	‡a Confidentiality.
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- 264 _1 \$aWashington, D.C. :\$bThe Office :\$bFor sale by the U.S.
G.P.O., Supt. of Docs.,\$c[1993]
- 300 \$aviii, 157 pages :\$billustrations ;\$c26 cm
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- 338 \$avolume\$bnc\$2rdacarrier
- 500 \$a"September 1993"--P. [4] of cover.
- 504 \$aIncludes bibliographical references and index.
- 500 \$a"OTA-TCT-576"--P. [4] of cover.
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- 650 _2 \$aMedical Records.
- 650 _2 \$aMedical Records Systems, Computerized.
- 710 1_ \$aUnited States.\$bCongress.\$bOffice of Technology Assessment.

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086 0 Y 3.T 22/2:2 P 93

086 0 Y 3.T 22/2:2 P 93/2

088 OTA-TCT-576

090 \$b

245 00 Protecting privacy in computerized medical information / \$c U.S. Congress, Office of Technology Assessment.

260 Washington, D.C. : \$b The Office : \$b For sale by the U.S. G.P.O., Supt. of Docs., \$c [1993]

300 viii, 157 pages : \$b illustrations ; \$c 26 cm

336 text \$b txt \$2 rdacontent

337 unmediated \$b n \$2 rdamedia

338 volume \$b nc \$2 rdacarrier

500 "September 1993"--Page 4 of cover.

504 Includes bibliographical references and index.

500 "OTA-TCT-576"--Page 4 of cover.

650 0 Medical records \$x Access control \$z United States.

650 0 Privacy, Right of \$z United States.

650 0 Confidential communications.

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776 08 \$i Online version: \$t Protecting privacy in computerized medical information. \$d Washington, D.C.
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: The Office : For sale by the U.S.G.P.O., Supt. of Docs., [1993] \$w (OCoLC)609045582

Attachment 2F

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LC control no.: sh 85030929

LCCN Permalink: <https://lcn.loc.gov/sh85030929>

HEADING: Confidential communications

000 01083cz a2200373n 450

001 4683170

005 20120323071143.0

008 860211i| anannbabn |b ana

010 __ |a sh 85030929

035 __ |a (DLC)sh 85030929

035 __ |a (DLC)7178762

035 __ |a (DLC)sp 85030929

035 __ |a (DLC)358725

040 __ |a DLC |c DLC |d DLC |d NNU-L

150 __ |a Confidential communications

450 __ |a Communications, Confidential

450 __ |a Confidential communications |x Law and legislation

450 __ |a Confidential relationships

450 __ |a Confidentiality

450 __ |a Privileged communications (Confidential communications)

450 __ |a Professional secrets

450 __ |a Secrets, Professional

550 __ |w g |a Confession

550 __ |w g |a Criminal law

550 __ |w g |a Evidence (Law)

550 __ |w g |a Objections (Evidence)

550 __ |w g |a Personality (Law)

550 __ |w g |a Professional ethics

550 __ |w g |a Secrecy

550 __ |a Privacy, Right of

670 __ |a UMI business vocab.

906 __ |t 0724 |u te04 |v 0

952 __ |a LC-BRF

953 __ |a xx00 |b ym04

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Attachment 3A

Technical reference model

LDR		01547nas a2200433 a 4500
001		003324889
003		MiAaHDL
005		20170109000000.0
006		m d
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007		cr unu
008		990315c19979999dcuar f0 0eng d
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035	□ □	‡a sdr-osu.b51887484
035	□ □	‡a sdr-ucbk.b157976488
035	□ □	‡a (GPO)99054178
037	□ □	‡b Chief Information Officer, Office of System Architecture and Engineering, Washington D.C. 20231
040	□ □	‡a EYM ‡c EYM ‡d GPO ‡d DLC ‡d MvI
042	□ □	‡a lcd
043	□ □	‡a n-us---
049	9 9	‡a RECLAMATION
074	□ □	‡a 0254
086	0 □	‡a C 21.2:M 72/
098	□ □	‡a C212M72
098	□ □	‡a Electronicjournal
099	□ 8	‡a C 21.2:M 72/
035	□ □	‡a (OCoLC)40963418
110	1 □	‡a United States. ‡b Patent and Trademark Office.
245	1 0	‡a Technical reference model / ‡c United States Patent and Trademark Office.
246	1 3	‡a PTO technical reference model
246	1 3	‡a TRM
246	3 □	‡a United States Patent and Trademark Office technical reference model
260	□ □	‡a Washington, D.C. : ‡b Chief Information Officer, Office of System Architecture and Engineering,
300	□ □	‡a v. : ‡b ill. ; ‡c 28 cm.
310	□ □	‡a Annual
538	□ □	‡a Mode of access: Internet.

610	1 0	\$a United States. \$b Patent and Trademark Office \$x Automation \$v Handbooks, manuals, etc.
710	1 □	\$a United States. \$b Patent and Trademark Office. \$b Office of System Architecture and Engineering.
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DAT	0 □	\$a 20000710140218.0 \$b 20170109000000.0
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FMT	□ □	\$a SE
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974	□ □	\$b MIU \$c MIU \$d 20221129 \$s google \$u mdp.39015041246524 \$z 1997 \$y 1997 \$r pd \$q bib \$t US fed doc
974	□ □	\$b MIU \$c MIU \$d 20221116 \$s google \$u mdp.39015041286165 \$z 1996 \$y 1996 \$r pd \$q bib \$t US fed doc
974	□ □	\$b OU \$c OSU \$d 20200922 \$s google \$u osu.32437011027766 \$r pd \$q bib \$t US fed doc
974	□ □	\$b UC \$c UCBK \$d 20220531 \$s google \$u uc1.c069064692 \$z v.4 (1998) \$y 1998 \$r pd \$q bib \$t US fed doc
974	□ □	\$b UC \$c UCBK \$d 20220531 \$s google \$u uc1.c069083823 \$z v.5 (1999) \$y 1999 \$r pd \$q bib \$t US fed doc

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LEADER 01793cas a2200433 a 4500
001 9950731683602122
005 20130812144427.0
008 990315d199u1999dcuar f0 0eng c
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042 \$apcc
043 \$an-us---
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074 \$a0254
086 0_ \$aC 21.2:M 72/
110 1_ \$aUnited States.\$bPatent and Trademark Office.
245 10 \$aTechnical reference model /\$cUnited States Patent and Trademark Office.
246 3_ \$aUnited States Patent and Trademark Office technical reference model
246 13 \$aTRM

246 13 \$aPTO technical reference model

260 \$aWashington, D.C. :\$bChief Information Officer, Office of System Architecture and Engineering

300 \$avolumes :\$billustrations ;\$c28 cm

310 \$aAnnual

336 \$atext\$btxt\$2rdacontent

337 \$aunmediated\$bnc\$2rdamedia

338 \$avolume\$bnc\$2rdacarrier

362 1_ \$aCeased with: Version 5.0 (Oct. 26, 1999).

500 \$aAt head of title: United States Patent and Trademark Office.

530 \$aFinal issue available online.

588 \$aDescription based on: Version 2.0 (Nov. 1, 1996).

588 \$aLatest issue consulted: Version 5.0 (Oct. 26, 1999).

610 10 \$aUnited States.\$bPatent and Trademark Office\$xAutomation.

610 10 \$aUnited States.\$bPatent and Trademark Office\$xInformation services.

710 1_ \$aUnited States.\$bPatent and Trademark Office.\$bOffice of System Architecture and Engineering.

776 1_ \$aUnited States. Patent and Trademark Office.\$tTechnical reference model\$w(OCoLC)645723621

856 41 \$3Version 5.0 (Oct. 26,1999)\$uhttps://purl.fdlp.gov/GPO/LPS4794

852 3_ \$bLAW\$cdoc\$hC 21.2:\$iM 72/

852 3_ \$bREMOTE\$cvsfgpo

MMS IDs

Document ID:

999899399402121

Network Electronic IDs:

999899399402121

Network Physical IDs:

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mms_mad_ids:

9950731683602122

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005 20130307070429.0

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010 __ |a n 79076648

035 __ |a (OCoLC)oca00309321

035 __ |a (DLC)n 79076648

040 __ |a DLC |b eng |e rda |c DLC |d DGPO |d DLC-S |d DGPO |d DLC

110 1_ |a United States. |b Patent and Trademark Office

410 2_ |a PTO

410 2_ |a U.S. Patent & Trademark Office

410 2_ |a U.S. Patent and Trademark Office

410 1_ |a United States. |b Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

410 1_ |a United States. |b Department of Commerce. |b Patent and Trademark Office

410 1_ |a United States. |b Patent & Trademark Office

410 2_ |a USPTO

510 1_ |w a |a United States. |b Patent Office

510 1_ |w r |i Hierarchical superior: |a United States. |b Department of Commerce

670 __ |a Its Official gazette ... Feb. 11, 1975-

670 __ |a A Career with the Patent & Trademark Office, 1992?: |b t.p.

670 __ |a Project XL (U.S.). Inventive thinking resource directory [MI] 1989: |b t.p. (Department of Commerce, U.S. Patent and Trademark Office)

670 __ |a Index to the U.S. patent classification system, Dec. 1993: |b t.p. (U.S. Department of Commerce, U.S. Patent and Trademark Office; Assistant Secretary and Commissioner of Patents and Trademarks)

670 __ |a Phone call to Patent and Trademark Commissioner's office, 7/6/94 |b (office is both an Assistant Secretary of Commerce unit and the Patent and Trademark Commissioner's office)

670 __ |a Its Commissioner of Patents and Trademarks annual report [MI] fiscal year '93: |b t.p. (Assistant Secretary of Commerce and Commissioner of Patents and Trademarks) t.p. verso (U.S. Department of Commerce, U.S. Patent and Trademark Office) p. 1

(USPTO)

670 __ |a Working for our customers, fiscal year 1994: |b t.p. (U.S> Patent and trademark Office) p. 1 (PTO)

670 __ |a USAPat, facsimile images of United States patents [CF] 1996?: |b container (U.S. Patent & Trademark Office)

952 __ |a RETRO

953 __ |a xx00 |b ba18

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LC control no.: sh 85010116

LCCN Permalink: <https://lcn.loc.gov/sh85010116>**HEADING:** Automation

000 01052cz a2200301n 450

001 4663043

005 20120321074021.0

008 860211i| anannbabn |b ana

010 __ |a sh 85010116

035 __ |a (DLC)sh 85010116

035 __ |a (DLC)9728

040 __ |a DLC |c DLC |d DLC

150 __ |a Automation

360 __ |i subdivision |a Automation |i under names of individual corporate bodies and under types of industries, buildings, processes, systems, and organizations, e.g. |a Construction industry--Automation; |i and subdivision |a Effect of automation on |i under occupational groups and types of employees

450 __ |a Automatic factories

450 __ |a Automatic production

450 __ |a Computer control

450 __ |a Engineering cybernetics

450 __ |a Factories |x Automation

550 __ |w g |a Industrial engineering

550 __ |w g |a Mechanization

550 __ |a Assembly-line methods

550 __ |a Automatic control

550 __ |a Automatic machinery

550 __ |a CAD/CAM systems

550 __ |a Robotics

906 __ |t 9712 |u te03 |v 0

953 __ |a xx00 |b ta25

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MARC Display

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LC control no.: sh 85066157

LCCN Permalink: <https://lcn.loc.gov/sh85066157>

HEADING: Information services

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001 4717235

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008 860211i| anannbabn |b ana

010 __ |a sh 85066157

035 __ |a (DLC)sh 85066157

035 __ |a (DLC)63920

040 __ |a DLC |c DLC |d DLC

053 _0 |a ZA3150 |b ZA3159

150 __ |a Information services

360 __ |i subdivision |a Information services |i under names of countries, cities, etc., individual persons, and corporate bodies, and under classes of persons, ethnic groups, military services, and topical headings

450 __ |a Data collection services

450 __ |a Information brokers

450 __ |a Information centers

450 __ |a Information science service organizations

450 __ |a Information service providers

450 __ |a Providers of information services

550 __ |w g |a Information retrieval

550 __ |w g |a Information science

550 __ |a Documentation

550 __ |a Research

670 __ |a The Burwell directory of information brokers, c1991.

670 __ |a LC database, Aug. 26, 1996 |b (Information service providers)

680 __ |i Here are entered works on organizations that provide information services. Works on sources of information in general, not limited to a specific format or medium, including works that list organizations other than information services as sources of information, are entered under |a Information resources. |i Works on sources of information in a specific format or medium are entered under the heading for the format or medium.

681 __ |i Note under |a Information resources

906 __ |t 9818 |u te04 |v 1

953 __ |a xx00 |b ta25

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246 3 United States Patent and Trademark Office technical reference model
246 13 TRM
246 13 PTO technical reference model
260 Washington, D.C. : \$b Chief Information Officer, Office of System Architecture and Engineering
300 v. : \$b ill. ; \$c 28 cm.
310 Annual
362 1 Ceased with: Version 5.0 (Oct. 26, 1999).
500 At head of title: United States Patent and Trademark Office.
530 Final issue available online.
588 Description based on: Version 2.0 (Nov. 1, 1996).
588 Latest issue consulted: Version 5.0 (Oct. 26, 1999).
610 10 United States. \$b Patent and Trademark Office \$x Automation.
610 10 United States. \$b Patent and Trademark Office \$x Information services.
610 17 United States. \$b Patent and Trademark Office. \$2 fast \$0 (OCoLC)fst00534684
650 7 Automation. \$2 fast \$0 (OCoLC)fst00822786
650 7 Information services. \$2 fast \$0 (OCoLC)fst00972696
655 7 Handbooks and manuals. \$2 fast \$0 (OCoLC)fst01423877
655 7 Handbooks and manuals. \$2 lcgft
710 1 United States. \$b Patent and Trademark Office. \$b Office of System Architecture and Engineering.
776 1 United States. Patent and Trademark Office. \$t Technical reference model \$w (OCoLC)645723621
856 41 \$3 Version 5.0 (Oct. 26,1999) \$u <https://purl.fdlp.gov/GPO/LPS4794> \$7 0

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MARC Bibliographic Record

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042 \$apcc
049 \$aGZMA
050 00 \$aHG1710\$b.R33 2003
082 00 \$a658.8/8\$b221
100 1_ \$aRadu, Cristian.
245 10 \$aImplementing electronic card payment systems /\$cCristian Radu.

264 _1 \$aBoston :\$bArtech House,\$c[2003]

264 _4 \$c@2003

300 \$axv, 446 pages :\$billustrations ;\$c24 cm.

336 \$a\$text\$btxt\$2rdacontent

337 \$aunmediated\$bnc\$2rdamedia

338 \$avolume\$bnc\$2rdacarrier

490 1_ \$aArtech House computer security series

504 \$aIncludes bibliographical references and index.

650 _0 \$aElectronic funds transfers.

650 _0 \$aCredit cards.

650 _0 \$aDebit cards.

650 _0 \$aPayment\$xData processing.

650 _0 \$aElectromagnetic compatibility.

830 _0 \$aArtech House computer security series

994 \$a92\$bGZM

997 \$aMARCIVE

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Network Physical IDs:

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mms_mad_ids:

9958570753602122

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001 4694227

005 20190825061606.0

008 860211i| anannbabn |b ana

010 __ |a sh 85042329

035 __ |a (DLC)sh 85042329

035 __ |a (DLC)40912

040 __ |a DLC |c DLC |d DLC |d DGPO

053 _0 |a HG1710 |b HG1710.5

150 __ |a Electronic funds transfers

450 __ |a EFT (Electronic funds transfers)

450 __ |a Electronic banking

450 __ |a Electronic check clearing

450 __ |a Electronic money systems

450 __ |a Electronic payments systems

450 __ |a Electronic transfer of funds

450 __ |a Funds, Electronic transfers of

450 __ |a Telebanking

450 __ |a Transfers of funds, Electronic

550 __ |w g |a Electronic data interchange

550 __ |a Electronic benefits transfers

550 __ |a Home banking services

670 __ |a Funds transfer report, Sept. 1992: |b p. 2 (electronic funds transfer; EFT)

670 __ |a LC database, Oct. 18, 1994 |b (Telebanking)

670 __ |a LC database, Dec. 8, 1999 |b (Electronic banking)

670 __ |a Merriam-Webster dictionary online, June 27, 2018 |b (electronic funds transfer: transfer of money from one bank to another using their computer systems)

680 __ |i Here are entered works on transferring money from one bank to another using computer systems.

906 __ |t 9951 |u te07 |v 0

910 __ |a Proposal saved by tc03 on 07/19/2018 at 08:29:53

953 __ |a xx00 |b se01

906 __ |t 1809 |v 0

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MARC Display

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LCCN Permalink: <https://lcn.loc.gov/sh85033865>

HEADING: Credit cards

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001 4686037

005 20120323071605.0

008 860211i| anannbabn |b ana

010 __ |a sh 85033865

035 __ |a (DLC)sh 85033865

035 __ |a (DLC)32722

040 __ |a DLC |c DLC |d DLC

053 _0 |a HG3755.7 |b HG3755.8

150 __ |a Credit cards

450 __ |a Cards, Charge

450 __ |a Cards, Credit

450 __ |a Charge cards

550 __ |w g |a Consumer credit

550 __ |w g |a Point-of-sale systems industry

550 __ |a Charge accounts

670 __ |a Trouba, M.B. American awareness of advertising for charge or credit cards, 1989.

670 __ |a UMI business vocab. |b (Credit cards rt Charge accounts)

906 __ |t 9412 |u te05 |v 0

952 __ |a LC-BRF

953 __ |a xx00 |b se01

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035 __ |a (DLC)145356

040 __ |a DLC |c DLC |d DLC

053 _0 |a HG1710.5

150 __ |a Debit cards

450 __ |a Bank debit cards

450 __ |a Cards, Debit

550 __ |w g |a Banks and banking |x Customer services

670 __ |a Work cat.: Debit cards and the future ... 1984.

906 __ |t 9552 |u te03 |v 0

953 __ |a fe12 |b ta21

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035 __ |a (DLC)358998

040 __ |a DLC |c DLC |d MoSU-L

150 __ |a Payment

450 __ |a Payment |x Law and legislation

550 __ |w g |a Commercial law

550 __ |w g |a Extinguishment of debts

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550 __ |a Balance of trade

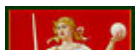
550 __ |a Debtor and creditor

906 __ |t 0724 |u te04 |v 0

953 __ |a xx00 |b ym58

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LC control no.: sh 85035857

LCCN Permalink: <https://lcn.loc.gov/sh85035857>

HEADING: Data processing

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035 __ |a (DLC)sh 85035857

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040 __ |a DLC |c DLC |d DLC

150 __ |a Data processing

260 __ |i subdivision |a Data processing |i under subjects for comprehensive works on the recording and handling of information about a subject by means of mechanical or electronic equipment, e.g. |a English language--Data processing; Universities and colleges--Data processing

906 __ |t 8729 |u fk07 |v 0

953 __ |a xx00 |b fj26

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LC control no.: sh 85042167

LCCN Permalink: <https://lcn.loc.gov/sh85042167>

HEADING: Electromagnetic compatibility

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040 __ |a DLC |c DLC |d DLC

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053 _0 |a TK7867.2 |c General

150 __ |a Electromagnetic compatibility

450 __ |a Compatibility, Electromagnetic

450 __ |a EMC (Electronics)

550 __ |w g |a Electronics

906 __ |t 9614 |u te04 |v 1

953 __ |a xx00 |b jg12

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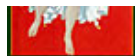
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020 9781580533058 \$q (alk. paper)

042 pcc

050 00 HG1710 \$b .R33 2003

082 00 658.8/8 \$2 21

084 QK 305 \$2 rvk

084 ELT 431f \$2 stub

090 \$b

049 DGSL

100 1 Radu, Cristian.

245 10 Implementing electronic card payment systems / \$c Cristian Radu.

260 Boston : \$b Artech House, \$c ©2003.

300 xv, 446 pages : \$b illustrations ; \$c 24 cm.

336 text \$b txt \$2 rdacontent

337 unmediated \$b n \$2 rdamedia

338 volume \$b nc \$2 rdacarrier

490 1 Artech House computer security series

500 "Artech House computing library."

504 Includes bibliographical references and index.

505 00 \$t Magnetic stripe debit and credit cards -- \$t Chip migration with EMV -- \$t Remote debit and credit with EMV -- \$t Magnetic Stripe Debit and Credit Cards -- \$t Payment Card Processing -- \$t Payment card processing at a glance -- \$t Roles involved in payment card processing -- \$t Payment card brands -- \$t Credit and debit payment cards -- \$t Focusing on the magnetic stripe card -- \$t Embossed financial data -- \$t Financial data on the magnetic stripe -- \$t Threats and security protections -- \$t Channel protection versus eavesdropping -- \$t Cardholder verification versus impersonation -- \$t Static authenticator versus modifying financial data -- \$t Timeliness versus card counterfeiting -- \$t Merchant attacks and colluding attacks -- \$t Processing at the point of service -- \$t Payment network and interchange messages -- \$t Message structure -- \$t Message flows -- \$t On-line authorization -- \$t Clearing and settlement -- \$t Chip Migration with EMV -- \$t Chip Migration -- \$t A business case for chip

migration -- \$t An overview of the chip card technology -- \$t Hardware and software structure of chip cards -- \$t Card file system and file referencing -- \$t Command and response format -- \$t Card application and terminal application -- \$t Proprietary payment application -- \$t Encoding data elements with a fixed format -- \$t Fixed file system organization -- \$t Preestablished command and response formats -- \$t Symmetric cryptographic technology -- \$t Interoperable payment application -- \$t Self-determined encoding of data elements -- \$t Customized file system organization -- \$t Variable formats for commands and responses -- \$t Asymmetric cryptographic support.

650 0 Electronic funds transfers.

650 0 Credit cards.

650 0 Debit cards.

650 0 Payment \$x Data processing.

650 0 Electromagnetic compatibility.

650 6 Transferts électroniques de fonds. \$0 (CaQQLa)000306603

650 6 Cartes de crédit. \$0 (CaQQLa)201-0064506

650 6 Cartes de débit. \$0 (CaQQLa)201-0143207

650 6 Paiement \$0 (CaQQLa)201-0007604 \$x Informatique. \$0 (CaQQLa)201-0380011

650 6 Compatibilité électromagnétique. \$0 (CaQQLa)201-0048198

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650 7 Debit cards. \$2 fast \$0 (OCoLC)fst00888759

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650 7 Electronic funds transfers. \$2 fast \$0 (OCoLC)fst00907204

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830 0 Artech House computer security series.

856 41 \$3 Table of contents \$u <http://bvbr.bib->

[bvb.de:8991/F?func=service&doc_library=BVB01&doc_number=013136865&line_number=0001&func_code=DB_RECORDS&service_type=MEDIA](http://bvbr.bib-bvb.de:8991/F?func=service&doc_library=BVB01&doc_number=013136865&line_number=0001&func_code=DB_RECORDS&service_type=MEDIA)

856 41 \$3 Table of contents \$u <http://bvbr.bib->

[bvb.de:8991/F?func=service&doc_library=BVB01&local_base=BVB01&doc_number=013136865&line_number=0001&func_code=DB_RECORDS&service_type=MEDIA](http://bvbr.bib-bvb.de:8991/F?func=service&doc_library=BVB01&local_base=BVB01&doc_number=013136865&line_number=0001&func_code=DB_RECORDS&service_type=MEDIA)

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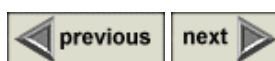
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Search Request: Left Anchored Title = Implementing Electronic Card Payment Systems

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Implementing electronic card payment systems / Cristian Radu.

Type of Work: Text

Registration Number / Date: TX0005630450 / 2002-11-13

Title: Implementing electronic card payment systems / Cristian Radu.

Imprint: Boston : Artech House, c2003.

Description: 446 p.

Series: Artech House computer security series

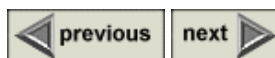
Copyright Claimant: Artech House, Inc.

Date of Creation: 2002

Date of Publication: 2002-10-31

Names: [Radu, Cristian](#)

[Artech House, Inc.](#)



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MARC Bibliographic Record

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008 080325s2008 nyu 000 0 eng
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015 \$aGBA858990\$2bnb
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049 \$aGZMA
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082 04 \$a652.80151\$222
100 1_ \$aHoffstein, Jeffrey.
245 13 \$aAn introduction to mathematical cryptography /\$cJeffrey Hoffstein, Jill Pipher, Joseph H. Silverman.
263 \$a200807
264 _1 \$a[New York] ;\$a[London] :\$bSpringer,\$c2008.

300 \$axv, 523 pages :\$billustrations ;\$c25 cm.

336 \$atext\$btxt\$2rdacontent

337 \$aunmediated\$bn\$2rdamedia

338 \$avolume\$bnc\$2rdacarrier

490 1_ \$aUndergraduate texts in mathematics

505 0_ \$aAn introduction to cryptography -- Discrete logarithms and Diffie-Hellman -- Integer factorization and RSA -- Combinatorics, probability, and information theory - - Elliptic curves and cryptography -- Lattices and cryptography -- Digital signatures -- Additional topics in cryptography.

504 \$aIncludes bibliographical references (pages 493-500) and index.

650 _0 \$aCryptography\$xMathematics.

700 1_ \$aPipher, Jill Catherine,\$d1955-

700 1_ \$aSilverman, Joseph H.,\$d1955-

830 _0 \$aUndergraduate texts in mathematics

938 \$aBaker and Taylor\$bBTCP\$nBK0007789447

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938 \$aCoutts Information Services\$bCOUT\$n7683807\$c49.95 USD

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HEADING: Mathematics

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053 _0 |a QA

150 __ |a Mathematics

360 __ |i subdivision |a Mathematics |i under topical headings for the mathematics applied in those fields, e.g. |a Investments--Mathematics; |i also phrase headings for types of mathematics; and headings beginning with the word |a Mathematical

450 __ |a Math

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050 00 QA268 \$b .H64 2008

082 04 652.80151 \$2 22

084 94A60 \$a 11T71 \$a 14G50 \$a 68P25 \$2 msc

090 \$b

100 1 Hoffstein, Jeffrey.

245 13 An introduction to mathematical cryptography / \$c Jeffrey Hoffstein, Jill Pipher, Joseph H. Silverman.

260 [New York] ; \$a [London] : \$b Springer, \$c 2008.

300 xv, 523 pages : \$b illustrations ; \$c 25 cm

336 text \$b txt \$2 rdacontent

337 unmediated \$b n \$2 rdamedia

338 volume \$b nc \$2 rdacarrier

490 1 Undergraduate texts in mathematics

505 0 An introduction to cryptography -- Discrete logarithms and Diffie-Hellman -- Integer factorization and RSA -- Combinatorics, probability, and information theory -- Elliptic curves and cryptography -- Lattices and cryptography -- Digital signatures -- Additional topics in cryptography.

504 Includes bibliographical references (pages 493-500) and index.

520 1 "This self-contained introduction to modern cryptography emphasizes the mathematics behind the theory of public key cryptosystems and digital signature schemes. The book focuses on these key topics while developing the mathematical tools needed for the construction and security analysis of diverse cryptosystems. Only basic filter algebra is required of the reader; techniques from algebra,

number theory, and probability are introduced and developed as required." "This book is an ideal introduction for mathematics and computer science students to the mathematical foundations of modern cryptography. The book includes an extensive bibliography and index; supplementary materials are available online."--Jacket.

650 0 Cryptography \$x Mathematics.

650 6 Cryptographie \$0 (CaQQLa)201-0039807 \$x Mathématiques. \$0 (CaQQLa)201-0380112

650 7 Cryptage. \$2 eclas

650 7 Cryptography \$x Mathematics. \$2 fast \$0 (OCoLC)fst00884558

650 7 Cryptography \$x Mathematics. \$2 nli

700 1 Pipher, Jill Catherine, \$d 1955-

700 1 Silverman, Joseph H., \$d 1955-

830 0 Undergraduate texts in mathematics.

856 41 \$3 Table of contents \$q application/pdf \$u [http://bvbr.bib-](http://bvbr.bib-bvb.de:8991/F?func=service&doc_library=BVB01&doc_number=016677307&line_number=0001&func_code=DB_RECORDS&service_type=MEDIA)

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856 41 \$3 Table of contents \$u [http://bvbr.bib-](http://bvbr.bib-bvb.de:8991/F?func=service&doc_library=BVB01&doc_number=016677307&line_number=0001&func_code=DB_RECORDS&service_type=MEDIA)

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856 41 Online access via Springerlink \$u <http://www.springerlink.com/content/978-0-387-77993-5/#section=229331&page=1> \$z Rutgers restricted.

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856 4 \$3 Cover \$q image/jpeg \$u <http://swbplus.bsz-bw.de/bsz285530615cov.htm> \$v 20090115095824

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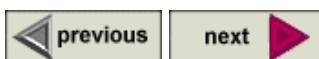
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An Introduction to Mathematical Cryptography.

Type of Work: Text

Registration Number / Date: TX0007228138 / 2008-09-19

Application Title: An Introduction to Mathematical Cryptography.

Title: An Introduction to Mathematical Cryptography.

Description: Book, 523 p.

Copyright Claimant: Springer Science+Business Media LLC, Transfer: by written agreement. Address: 233 Spring St., New York, NY, 10013.

Date of Creation: 2007

Date of Publication: 2008-08-12

Nation of First Publication: United States

Authorship on Application: Jeffrey Hoffstein; Domicile: United States. Authorship: Entire Text.

Jill Pipher; Domicile: United States. Authorship: Entire Text.

J.H. Silverman; Domicile: United States. Authorship: Entire Text.

Copyright Note: C.O. correspondence.

ISBN: 978-0-387-77993-5

Names: [Hoffstein, Jeffrey](#)

[Pipher, Jill](#)

[Silverman, J.H](#)

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260 [Faisalabad] : \$b [Asian Network for Scientific Information], \$c [2004]-
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310 Monthly, \$b 2011-
321 8 nos. per year, \$b 2007-2010
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337 computer \$b c \$2 rdamedia
338 online resource \$b cr \$2 rdacarrier
362 1 Began with vol. 3, no. 1 (2004).
588 0 Vol. 3, no. 1 (2004); title from PDF cover (Science Alert Web site, viewed Mar. 5, 2011).
588 1 Vol. 21, no. 1 (2022) (viewed December 23, 2022).
650 0 Information technology \$v Periodicals.
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650 0 Engineering \$v Periodicals.
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780 00 \$t Pakistan journal of information and technology \$w (OCoLC)705629482
856 40 \$u https://www.ansinet.com/jhome.php?issn=1812-5638 \$7 0
856 40 \$u http://bibpurl.oclc.org/web/45873 \$u https://scialert.net/jindex.php?issn=1812-5638 \$7 0

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LC control no.: sh2008104637

LCCN Permalink: <https://lcn.loc.gov/sh2008104637>

HEADING: Information technology Periodicals

000 00480cz a2200169n 450

001 7450757

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040 __ |a DLC |b eng |c DLC

150 __ |a Information technology |v Periodicals

667 __ |a Record generated for validation purposes.

670 __ |a Work cat.: Information Wissenschaft & Praxis, [2002]-

906 __ |t 8888 |u te00 |v 0

953 __ |a te00

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[Help](#)[New Search](#)[Search History](#)[Headings List](#)[Start Over](#)< [Previous](#)[Next](#) >[MARC Display](#)[Labelled Display](#)**LC control no.:** sh 85133164**LCCN Permalink:** <https://lcn.loc.gov/sh85133164>**HEADING:** Technology Periodicals

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001 4781905

005 20110729121812.0

008 860211|| anannbabn |n ana

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040 __ |a DLC |c DLC |d DLC

150 __ |a Technology |v Periodicals

906 __ |t 7647 |u ---- |v 0

953 __ |a xx00

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[Help](#)[New Search](#)[Search History](#)[Headings List](#)[Start Over](#)< [Previous](#)[Next](#) >[MARC Display](#)[Labelled Display](#)**LC control no.:** sh 85043188**LCCN Permalink:** <https://lcn.loc.gov/sh85043188>**HEADING:** Engineering Periodicals

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001 4695068

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008 860211|| anannbabn |n ana

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035 __ |a (DLC)sh 85043188

035 __ |a (DLC)41753

040 __ |a DLC |c DLC |d DLC

150 __ |a Engineering |v Periodicals

681 __ |i Example under |a Periodicals

906 __ |t 64-- |u ---- |v 0

953 __ |a xx00

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BOOK

Encyclopedia of information science and technology

[Full Record](#)[MARC Tags](#)

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005	20141113172454.0
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955	— a lh45 2008-07-01 i lh45 2008-07-01 e lh45 2008-07-01 to CIP (Dewey completed) a ps08 2008-09-16 v 1-8 rec'd., to CIP ver. f lh36 2008-09-25 g lh36 2008-09-25 (v. 1-8) to BCCD a xb05 2008-11-14 copy 2 (v.1-8) added a xb05 2008-11-14 copy 3
010	— a 2008029068
020	— a 9781605660264 (hardcover)
020	— a 9781605660271 (ebook)
040	— a DLC c DLC d DLC
050	00 a Z1006 b .E566 2009
082	00 a 004/.03 2 22
245	00 a Encyclopedia of information science and technology / c Mehdi Khosrow-Pour, editor.
250	— a 2nd ed.
260	— a Hershey, PA : b Information Science Reference, c c2009.
300	— a 8 v. : b ill. ; c 29 cm.
504	— a Includes bibliographical references and index.
520	— a "This set of books represents a detailed compendium of authoritative, research-based

entries that define the contemporary state of knowledge on technology"--Provided by publisher.

650	_0	a Information science v Encyclopedias.
650	_0	a Information technology v Encyclopedias.
700	1_	a Khosrow-Pour, Mehdi, d 1951-
856	41	3 Table of contents only u http://www.loc.gov/catdir/toc/ecip0822/2008029068.html

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035 __ |a (DLC)5166110

035 __ |a (DLC)sp 85066150

035 __ |a (DLC)261307

035 __ |a (DLC)8244618

035 __ |a (DLC)464779

040 __ |a DLC |c DLC |d DLC

053 _0 |a Z665 |b Z718.8

150 __ |a Information science

550 __ |w g |a Communication

550 __ |a Information literacy

550 __ |a Library science

670 __ |a LC database, Feb. 20, 1998 |b (informatics 15 times more likely on a computer science book than on an information science book)

906 __ |t 1018 |u tc03 |v 0

953 __ |a xx00 |b td13

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MARC Display

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LC control no.: sh 85042997

LCCN Permalink: <https://lcn.loc.gov/sh85042997>

HEADING: Encyclopedias and dictionaries

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001 4694880

005 20120323073014.0

008 860211i| anannbabn |a ana

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035 __ |a (DLC)sh 85042997

035 __ |a (DLC)5706469

035 __ |a (DLC)sp 85042997

035 __ |a (DLC)286945

040 __ |a DLC |c DLC |d DLC

053 _0 |a AE |c Encyclopedias

053 _0 |a AG |c Dictionaries

150 __ |a Encyclopedias and dictionaries

360 __ |i subdivisions |a Dictionaries |i or |a Encyclopedias |i under subjects

450 __ |a Books of knowledge

450 __ |a Cyclopedias

450 __ |a Dictionaries

450 __ |a Encyclopedias and dictionaries, English

450 __ |a Knowledge, Books of

450 __ |a Subject dictionaries

550 __ |w g |a Reference books

680 __ |i Here are entered comprehensive reference works in the English language consisting of explanatory articles arranged alphabetically or topically and not limited to a specific topic. Works of this type in other languages are entered under headings of the type Encyclopedias and dictionaries, [language], e.g. |a Encyclopedias and dictionaries, French; Encyclopedias and dictionaries, Spanish. |i Works about encyclopedias and dictionaries in general, and works about English-language encyclopedias and dictionaries, are entered under |a Encyclopedias and dictionaries |i with further subdivision, e.g. |a Encyclopedias and dictionaries--History and criticism. |i Works consisting of comprehensive alphabetical lists of the words of a specific language, usually with definitions, are entered under the heading for the language with subdivision Dictionaries, e.g. |a English language--Dictionaries. |i Works about dictionaries of a

specific language are entered under the heading for the language with subdivision
Lexicography, e.g. |a English language--Lexicography.

906 __ |t 0233 |u te04 |v 0

953 __ |a xx00 |b td14

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[Help](#)[New Search](#)[Search History](#)[Headings List](#)[Start Over](#)< [Previous](#)[Next](#) >[MARC Display](#)[Labelled Display](#)**LC control no.:** n 83719375**LCCN Permalink:** <https://lcn.loc.gov/n83719375>**HEADING:** Information technology

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008 830301n| acaabaaan |n ana

010 __ |a n 83719375

035 __ |a (OCoLC)oca01046157

040 __ |a DLC |b eng |c DLC |d OCoLC

130 _0 |a Information technology

643 __ |a Aldershot, Hants |a Brookfield, VT |b Gower

644 __ |a f |5 DLC

645 __ |a t |5 DLC

646 __ |a s |5 DLC

670 __ |a Townsend, K. Choosing and using a word processor, c1981: |b cover

953 __ |a eb20

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BLvl	m	Form		Conf	0	Bioq		MRec	
		Cont	b	GPub		LitF	0	Indx	1
Desc	a	Ills	a	Fest	0	DtSt	s	Dates	2009

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016 7 014772548 \$2 Uk

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020 9781605660271 \$q (ebook)

020 1605660272 \$q (ebook)

050 00 Z1006 \$b .E566 2009

082 00 004/.03 \$2 22

090 \$b

245 00 Encyclopedia of information science and technology / \$c Mehdi Khosrow-Pour, editor.

250 2nd ed.

260 Hershey, PA : \$b Information Science Reference, \$c ©2009.

300 8 volumes : \$b illustrations ; \$c 29 cm

336 text \$b txt \$2 rdacontent

337 unmediated \$b n \$2 rdamedia

338 volume \$b nc \$2 rdacarrier

504 Includes bibliographical references and index.

520 "This set of books represents a detailed compendium of authoritative, research-based entries that define the contemporary state of knowledge on technology"--Provided by publisher.

505 0 v. 1. A-B -- v. 2. C-Der -- v. 3. Des-F -- v. 4. G-Internet -- v. 5. Intero-Mo -- v. 6. Mu-Q -- v. 7. R-S -- v. 8. T-Z.

650 0 Information science \$v Encyclopedias.

650 0 Information technology \$v Encyclopedias.

650 6 Sciences de l'information \$0 (CaQQLa)201-0003524 \$v Encyclopédies. \$0 (CaQQLa)201-0377762

650 6 Technologie de l'information \$0 (CaQQLa)201-0023285 \$v Encyclopédies. \$0 (CaQQLa)201-0377762

650 7 Information science. \$2 fast \$0 (OCoLC)fst00972640

650 7 Information technology. \$2 fast \$0 (OCoLC)fst00973089

650 7 Informationstechnik \$2 gnd \$0 (DE-588)4026926-7

650 7 Informations- und Dokumentationswissenschaft \$2 gnd \$0 (DE-588)4128313-2

655 2 Encyclopedia \$0 (DNLM)D019500

655 7 encyclopedias. \$2 aat \$0 (CStmoGRI)aatgf300129439

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655 7 Encyclopédies. \$2 rvmgf \$0 (CaQQLa)RVMGF-000001062
700 1 Khosrow-Pour, Mehdi, \$d 1951-
856 41 \$3 Table of contents \$u <http://catdir.loc.gov/catdir/toc/ecip0822/2008029068.html>

Attachment 8A

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BOOK

A new way to pay : creating competitive advantage through the EMV smart card ...

[Full Record](#)[MARC Tags](#)

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005	20060217112027.0
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925	0_ a acquire b 2 shelf copies x policy default
955	— a se30 2005-02-25 i se30 2005-02-25 e se30 2005-02-25 to Dewey a aa19 2005-03-01 a ps08 2005-10-25 1 copy rec'd., to CIP ver. a ps08 2005-10-25 1 copy rec'd., to CIP ver. f sc06 2005-11-29 (rev sc19) g sc06 2005-12-05 to BCCD a sp17 2006-02-17 copy 2 added
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020	— a 0566086883 (alk. paper)
040	— a DLC c DLC d DLC
042	— a pcc
050	00 a HF5415.5 b .H24 2005
082	00 a 658.8/83 2 22
100	1_ a Haddad, Aneace.
245	12 a A new way to pay : b creating competitive advantage through the EMV smart card standard / c Aneace Haddad.
260	— a Aldershot, Hants, England ; a Burlington, VT : b Gower, c c2005.
300	— a vii, 143 p. : b ill. ; c 25 cm.
500	— a Rev. ed. of: Using smart cards to gain market share. 2000.

504	__	a Includes bibliographical references (p. [139]-140) and index.
505	0_	a The threats--commoditization and fraud -- Creating competitive advantage through a richer payment experience -- Creating competitive advantage through better branding -- Creating competitive advantage using technology -- Intelligent money--a glimpse of the future -- Key factors for a profitable EMV deployment.
650	_0	a Customer services.
650	_0	a Smart cards.
650	_0	a Marketing.
700	1_	a Haddad, Aneace. t Using smart cards to gain market share.
856	41	3 Table of contents u http://www.loc.gov/catdir/toc/ecip058/2005005499.html

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Status Not Charged

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LCCN Permalink: <https://lcn.loc.gov/sh85034965>

HEADING: Customer services

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008 860211i| anannbabn |a ana

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035 __ |a (DLC)33791

040 __ |a DLC |c DLC |d DLC

053 _0 |a HF5415.5

150 __ |a Customer services

360 __ |i subdivision |a Customer services |i under names of individual corporate bodies and types of organizations and industries, e.g. |a Construction industry--Customer services

450 __ |w nne |a Customer service

450 __ |a Service, Customer

450 __ |a Service (in industry)

450 __ |a Services, Customer

450 __ |a Technical service

550 __ |w g |a Customer relations

906 __ |t 9448 |u te03 |v 0

953 __ |a xx00 |b ta28

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MARC Display

Labelled Display

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LCCN Permalink: <https://lcn.loc.gov/sh85123621>

HEADING: Smart cards

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008 860211i| anannbabn |a ana

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035 __ |a (DLC)119342

040 __ |a DLC |c DLC |d DLC

053 _0 |a TK7895.S62

150 __ |a Smart cards

450 __ |a Cards, Smart

450 __ |a Chip cards

450 __ |a IC cards

450 __ |a Integrated circuit cards

450 __ |a Memory cards

550 __ |w g |a Computer storage devices

550 __ |w g |a Expansion boards (Microcomputers)

550 __ |a Near-field communication

910 __ |a Record saved by td04 on 11/17/2017 at 08:25:21

910 __ |a Proposal saved by tc09 on 10/11/2011 at 15:32:22

953 __ |a xx00 |b jg12

906 __ |t 1126 |v 1

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008 860211i| anannbabn |b ana

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035 __ |a (DLC)sh 85081333

035 __ |a (DLC)78567

040 __ |a DLC |c DLC |d DLC

053 _0 |a HF5410 |b HF5417.5

150 __ |a Marketing

360 __ |i subdivision |a Marketing |i under types of commodities, products, services, and institutions providing products or services

450 __ |a Consumer goods |x Marketing

450 __ |a Domestic marketing

450 __ |a Retail marketing

450 __ |a Retail trade |x Marketing

550 __ |w g |a Industrial management

550 __ |a Aftermarkets

550 __ |a Selling

670 __ |a UMI business vocab. |b (Domestic markets)

906 __ |t 9612 |u te03 |v 0

952 __ |a LC-BRF

953 __ |a xx00 |b lj07

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BLvl	m	Form		Conf	0	Bioq		MRec		Ctry	enk
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019 61757159 \$a 62306894

020 0566086883 \$q (alk. paper)

020 9780566086885 \$q (alk. paper)

042 pcc

050 00 HF5415.5 \$b .H24 2005

082 00 658.8/83 \$2 22

084 QK 305 \$2 rvk

090 \$b

100 1 Haddad, Aneace.

245 12 A new way to pay : \$b creating competitive advantage through the EMV smart card standard / \$c Aneace Haddad.

260 Aldershot, Hants, England ; \$a Burlington, VT : \$b Gower, \$c ©2005.

300 vii, 143 pages : \$b illustrations ; \$c 25 cm

336 text \$b txt \$2 rdacontent

337 unmediated \$b n \$2 rdamedia

338 volume \$b nc \$2 rdacarrier

500 Revised edition of: Using smart cards to gain market share. 2000.

504 Includes bibliographical references (pages 139-140) and index.

505 0 The threats--commoditization and fraud -- Creating competitive advantage through a richer payment experience -- Creating competitive advantage through better branding -- Creating competitive advantage using technology -- Intelligent money--a glimpse of the future -- Key factors for a profitable EMV deployment.

520 1 "Aneace Haddad's A New Way to Pay is about enabling cardholders and merchants to see card payment as something exciting and different, so that they will focus on the added value that your card provides, rather than simply the cost it represents."--BOOK JACKET.

650 0 Customer services.

650 0 Smart cards.

650 0 Marketing.

650 2 Marketing \$0 (DNLM)D040541

650 6 Service à la clientèle. \$0 (CaQQLa)201-0081600

650 6 Cartes à mémoire. \$0 (CaQQLa)201-0173599

650 6 Marketing. \$0 (CaQQLa)201-0070166

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 650 7 Marketing. \$2 fast \$0 (OCoLC)fst01010167
 650 7 Smart cards. \$2 fast \$0 (OCoLC)fst01121546
 650 7 Kreditkarte \$2 gnd \$0 (DE-588)4032937-9
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