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A GUIDE TO DEVELOPING RECORDKEEPING STRATEGIES FOR WEBSITES

ARCHIVES NEW ZEALAND

TE RUA MAHARA O TE KĀWANATANGA

Issued June 2004/Revised June 2006



Archives
New Zealand
*Te Rua Mahara
o te Kāwanatanga*



RECORDKEEPING GUIDES





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1. > INTRODUCTION

This guide provides best practice advice for public offices and local authorities to develop strategies to manage their websites as public or local authority records. It articulates key principles for managing websites as records and, based on an analysis of website technology, assesses a range of recordkeeping strategies that organisations can use. The expected audience is developers, vendors, purchasers and implementers of websites and this guide assumes a familiarity with website technologies.

Good recordkeeping by public offices and local authorities is fundamental to a well-functioning democracy since it provides the mechanism whereby the public sector can account for its decisions and actions to Government and its citizens. Records also provide evidence for citizens to confirm or claim their rights and entitlements as well as providing individual public servants with evidence to justify their decisions. Moreover, good recordkeeping is simply good business practice.

Recordkeeping systems facilitate:

- > efficiency, by making information readily available when needed for decision-making and operational activities;
- > sound use of financial resources, by allowing timely disposal of non-current records;
- > accountability, by enabling the creation of a complete and authoritative record of official activities;
- > compliance, by demonstrating that legal requirements have been met; and
- > risk mitigation, by managing the risks associated with illegal loss or destruction of records, and from inappropriate or unauthorised access to records.

All data or documents that are transmitted or published by public office or local authority websites are public records or local authority records and subject to the requirements of the Public Records Act 2005.

Public offices and local authorities should capture all data and documents that are published or transmitted by websites into recordkeeping systems.

For public offices, these must be actively maintained until, under authorisation of the Chief Archivist, they are either destroyed or transferred to Archives New Zealand for long-term preservation.

For local authorities, where this includes local authority protected records, these must be actively maintained until, under the authorisation of the Chief Archivist, they are either disposed of or transferred to the control of the Chief Archivist.

2. > DEFINITIONS

Web records

All documents or data that are published or transmitted by websites.

Recordkeeping metadata

Data that enables the creation, management, and use of records through time. Recordkeeping metadata can be used to identify, authenticate, and contextualize records as well as the people, processes and systems that create, manage, and maintain and use them.¹

¹ Archiving Metadata Forum. 2000. *Recordkeeping Metadata Workshop. Proceedings of the Archiving Metadata Forum June 5-8, 2000*, p4.

3. > REGULATORY ENVIRONMENT

In relation to their websites, public offices and local authorities should take into account relevant public sector legislation, policies and guidelines. Of particular relevance are the Public Records Act 2005, the National Library of New Zealand Act 2003, and the *New Zealand Government Web Guidelines*.²

Web records are records in terms of the Public Records Act. Public offices and local authorities are required to create and maintain full and accurate records of their activities, including the information and activities transacted through their websites. These records must be maintained in accessible form until they are no longer required. For public offices, these records can not be disposed of without the authority of the Chief Archivist. For local authorities, where the website includes protected records these may not be disposed of without the authority of the Chief Archivist.³ The Chief Archivist is also empowered to provide advice and issue guidelines on best practice management of public records and local authority records, including web records.

The National Library of New Zealand also fulfils a statutory role with regard to public sector and local government websites.⁴ By harvesting government websites it collects and preserves New Zealand's documentary heritage, thus complementing Archives New Zealand's role.

The advice in this guide extends the discussion on archiving websites in the *New Zealand Government Web Guidelines*.⁵

4. > KEY PRINCIPLES

Websites are used by government organisations to fulfill a range of purposes from delivery of basic information (web presence) to online access to critical information, downloading of forms, email interaction and, ultimately, completing transactions online by seamlessly integrating line of business systems.⁶

Implementing recordkeeping strategies for websites is fundamental to each of these purposes since a full and accurate record of official activities conducted via websites enables citizens to confirm or claim their rights and entitlements, and organisations to account for their decisions and actions.

4.1 > WEB RECORDS SHOULD BE MANAGED WITHIN RECORDKEEPING SYSTEMS

Recordkeeping best practice requires records, including web records, to be captured and managed within recordkeeping systems.⁷ Recordkeeping systems link records to business activities, retain records of past actions, and fix the content and structure of records.⁸

In practice web records can be captured and managed within recordkeeping systems either by capturing web records into existing corporate recordkeeping systems, or by integrating recordkeeping functionality into websites during their development or re-design. Integration costs can be minimised by implementing the recordkeeping strategies in this guide when website technologies are being refreshed.

² State Services Commission. 2004. *New Zealand Government Web Guidelines: Guidelines for the management and design of New Zealand public sector websites. Version 2.1.*

³ "Protected records" are defined in the Local Government Protected Records Schedule issued by the Chief Archivist under the Public Records Act, available at: <http://www.archives.govt.nz/continuum/>

⁴ National Library of New Zealand Act 2003. s31(3) empowers the National Library to make copies of documents that are made publicly available on the Internet.

⁵ *New Zealand Government Web Guidelines*, s3.4.7.

⁶ State Services Commission. 2003. *New Zealand E-Government Strategy – June 2003 – Update*, p17.

⁷ International Standards Organisation. 2001. *Information and documentation – Records management – Part 1: General. 15489-1:2001(E)*, s3.17.

⁸ Bearman, D. 1996. Item Level Control and Electronic Recordkeeping. *Archives and Museum Informatics* 10, No. 3: 195-245, p211.

Archives New Zealand's *Continuum* Resource Kit further articulates the characteristics of best practice recordkeeping systems.⁹ The Public Records Act Standard S5: *Electronic Recordkeeping Systems Standard* sets out the guidelines and functional specifications for electronic recordkeeping systems used by public offices and local authorities. In particular, the use of recordkeeping metadata to describe the creation, management, and use of web records over time is central to the recordkeeping strategies outlined in this guide.

4.2 > RECORDKEEPING IS A CONTINGENT ACTIVITY

Public offices and local authorities should carefully consider their regulatory, business, and technological environments in determining the recordkeeping strategy for their websites. They should weigh up the risks of not implementing a recordkeeping strategy for **all** information on their websites against the implementation costs. Archives New Zealand's General Disposal Authorities can assist with this analysis by showing you which common types of records are authorised for disposal when no longer of administrative use.¹⁰ Further advice can be found in the *International Standard on Records Management*.¹¹

In undertaking this risk analysis, organisations should note that this guide is issued as best practice advice and that compliance with the guide is not mandatory. For example, an organisation may choose to implement its own variation on one of the recordkeeping strategies outlined in the guide.

4.3 > WEB RECORDS SHOULD BE MANAGED OVER TIME

In general, the on-going management of electronic records revolves around the issues of media and file format obsolescence, and the continued linkage of recordkeeping metadata with individual records.

The viability of techniques for refreshing and migrating media formats, and for mitigating file format obsolescence (such as migration to an open-source file format or planned migrations through proprietary file formats) remain unproven over long periods of time. This is especially true for websites where the look-and-feel and specific functionality may be compromised as a result of file format migration.

Archives New Zealand is working to identify appropriate strategies and techniques for managing electronic records over time. In lieu of specific advice from Archives New Zealand, organisations should develop and implement their own strategies for refreshing and migrating media formats, migrating file formats, and managing recordkeeping metadata. As a general principle, however, you should, in addition to regulatory, business, and technological factors, take into account the following criteria when evaluating the long-term accessibility of file formats:¹²

Figure 1. Criteria for evaluating long-term accessibility of file formats.

Open standards	The file format should be documented, available to all, and free of charge to implement and use. ¹³
Ubiquity	The file format should be supported by a wide range of software applications.

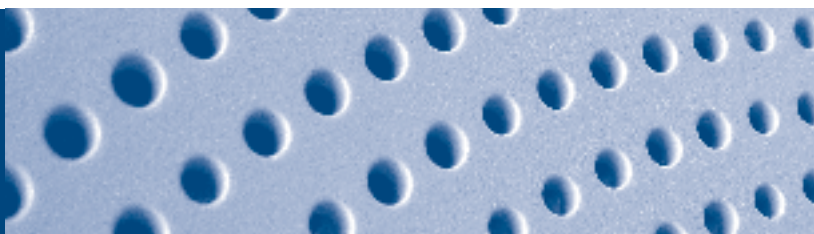
⁹ Archives New Zealand. 2000. *Continuum* Resource Kit.

¹⁰ Archives New Zealand. 2005. *General Disposal Authorities*.

¹¹ International Standards Organisation. 2001. *Information and documentation – Records management – Part 2: Guidelines*. 15489-2:2001(E), s4.2.4.2. Determining documents to be captured into a records system.

¹² National Archives of the United Kingdom. 2003. *Digital Preservation Guidance Note 1: Selecting file formats for long-term preservation*.

¹³ Linuxlab. 2003. *Open Standards*.



Stability	The file format should have remained relatively unchanged over time or be backwards compatible to earlier versions.
Metadata support	The file format should encapsulate metadata that enables the files to be managed and preserved over time.
Feature set	The file format should be 'fit for purpose'. The features specified by the format should be sufficient to support the range of functionality required for the business process, but equally it should not contain features that are unnecessary and thus make the format difficult to preserve over time.
Interoperability	The file format should be accessible by a wide range of software applications on a range of operating systems and hardware platforms.
Viability	The file format should have a built-in error-detection capability so any corruption of the file arising from its transmission over a network can be detected.

5. > WEBSITE TECHNOLOGIES

The Internet is the worldwide system of computer networks connected by the TCP/IP communication protocols.¹⁴ There are a number of other communication protocols that are often bundled with TCP/IP. Perhaps the most widely used protocol is HTTP which provides access to millions of pages of information on the Internet.¹⁵ The World Wide Web is that part of the Internet which is accessible via the HTTP protocol.

SMTP, the foundation for e-mail, is another key protocol.¹⁶ Recordkeeping requirements for e-mail are covered in Archives New Zealand's fact sheet F10: *E-Mail*.¹⁷

The classification of website technologies in this section provides the framework within which the recordkeeping strategies in this guide are articulated.¹⁸ Organisations should note that this classification is not the same as the range of purposes outlined in section 4.

5.1 > STATIC WEBSITES

The first generation of websites consisted of collections of static documents stored on a single web server and linked together by hyperlinks. Often limited to a description of an organisation, contact details, and electronic copies of policies and other publications, the focus of these 'brochure-ware' websites was information dissemination.¹⁹

Static websites may incorporate client-side technologies such as JavaScript and VBScript which enable the creation of simple dynamic elements such as pop-up menus and roll-over buttons.²⁰

5.2 > DYNAMIC WEBSITES

Dynamic websites enable organisations to deliver services via the web by incorporating dynamic elements into their design. Typically, dynamic websites incorporate forms into web pages that allow users to input data or enter search criteria for database querying. Server-side technologies such as the common gateway interface protocol (CGI), Active Server Page (ASP), and PHP facilitate the incorporation of forms into web pages.

¹⁴ TCP/IP stands for Transmission Control Protocol/Internet Protocol.

¹⁵ HTTP stands for Hypertext Transfer Protocol.

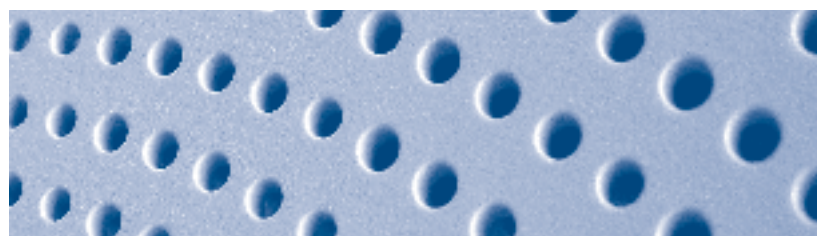
¹⁶ SMTP stands for Simple Mail Transfer Protocol.

¹⁷ Archives New Zealand. 2002. *E-mail Fact Sheet (F/10)*.

¹⁸ Ministry of Economic Development. 2000. *E-Commerce: A Guide for New Zealand Business*. The classification in this section of the Guide is based, in part, on this publication.

¹⁹ *E-Commerce: A Guide for New Zealand Business*, p21.

²⁰ *New Zealand Government Web Guidelines*, s6.3.5. Client-side technologies should only be used where required.



More sophisticated websites create individual web pages 'on-the-fly' in response to factors such as the time of day, what pages the user has looked at previously, and specific user input. These highly dynamic websites often store web pages as multiple objects within content management systems, and use cookies and stylesheets to personalise the way in which individual pages are displayed.

5.3 > E-COMMERCE WEBSITES AND E-BUSINESS SOLUTIONS

Websites commonly facilitate on-line purchase of services and products (e-commerce).²¹ Early instances of e-commerce, such as Electronic Data Interchange (EDI), relied upon expensive proprietary software and networks, thus limiting its use to businesses processing large quantities of routine transactions.²² Key issues for e-commerce websites include the need to ensure authenticity of identity and security of data.

E-business solutions refer to the integration of e-commerce websites with back-end applications. Integration of the components of an e-business solution is increasingly being enabled by the deployment of open standards, such as ebXML, to specify standard data structures and syntaxes for exchanging business data over the Internet.²³

5.4 > EXTRANETS AND INTRANETS

For the purposes of this guide, extranets and intranets are regarded as specialised websites. The appropriate recordkeeping strategy for an extranet or intranet depends, therefore, on the underlying website technology. Although these sites are often not publicly accessible and may be managed differently from public websites, they too contain records of your organisation's activities, which you need to identify and manage.

6. > RECORDKEEPING STRATEGIES FOR STATIC WEBSITES

Organisations with static websites (with or without simple dynamic elements) should implement one of the following object-oriented strategies:

6.1 > CAPTURE INDIVIDUAL OBJECTS

Definition

Individual objects posted to a website are captured and maintained.

Technique

1. > Determine which recordkeeping metadata elements should be created for each object posted to the website. For example:
 - Author
 - Date and time of creation
 - Action officer for posting to website
 - Date and time of posting to website
 - Action officer for removal from website
 - Date and time of removal from website
 - Title
 - URL
2. > When the publication is removed from the website, capture a copy of each object and its recordkeeping metadata within a corporate recordkeeping system.
3. > Develop and implement a strategy to migrate file formats, regularly refresh or migrate media formats, and manage recordkeeping metadata.

Benefits

It is possible to render each object as it was when published on the website.

²¹ *E-Commerce: A Guide for New Zealand Business*, p4.

²² *E-Commerce: A Guide for New Zealand Business*, p4.

²³ Organization for the Advancement of Structured Information Standards (OASIS). 2003. *ebXML FAQ*.

The complexity of maintaining the functionality and look-and-feel of a website is avoided.

Risks

Managing individual objects does not readily enable reconstruction of an entire website at a single point in time.

6.2 > SNAPSHOTS

Definition

Copies of a website are taken at regular intervals (snapshots).

Technique

1. > Determine how frequently copies of the website should be created. This may be at predefined intervals (e.g. every month) or when significant updates are made.
2. > Determine which recordkeeping metadata elements should be created for each snapshot. For example:
 - Date and time of snapshot
 - Creator of snapshot
 - URL for website (www.organisation.govt.nz or www.organisation.govt.nz/subsite)
3. > Create the snapshot.
A snapshot should include all aspects of the website to ensure that a fully functional website can be reconstructed. For example, the snapshot should also include any client-side scripts required to browse the website. Note that it may be necessary to make some modifications once the snapshot is created, such as disabling scripts and updating links.
4. > Capture the snapshot and its recordkeeping metadata within a corporate recordkeeping system.

5. > Develop and implement a strategy to migrate file formats, regularly refresh or migrate media formats, and manage recordkeeping metadata.

Benefits

Captures the content, look-and-feel, and functionality of a website at single points in time.

Risks

Copies of an entire website, including client-side scripts and other simple dynamic elements, must be maintained over time.

Organisations risk being unable to prove what information was made available on a website at a particular point in time, should it be required to do so. If a website is updated infrequently, then creating and maintaining a snapshot of each update may be appropriate. However, if updates are frequent, you should augment the snapshot strategy with change logs (See 6.3).

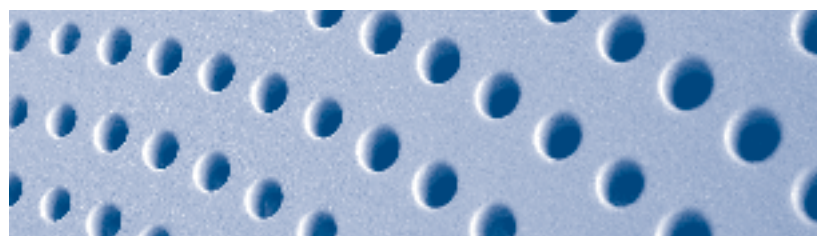
6.3 > SNAPSHOTS AND CHANGE LOGS

Definition

Copies of a website taken at regular intervals (snapshots) are augmented with a record of changes to the website between snapshots (change log).

Technique

1. > Determine how frequently copies of the website should be created. This may be at predefined intervals (e.g. every month) or when significant updates are made.
2. > Determine the recordkeeping metadata elements that should be captured in the change log. For example:
 - Date and time of change



- Action officer
- Details of change

3. > Establish procedures and processes to ensure a new change log is created and updated between snapshots.
4. > Create and capture each snapshot and its recordkeeping metadata (see 6.2) within a corporate recordkeeping system.
5. > Capture each change log within a corporate recordkeeping system prior to the creation of each new snapshot and explicitly link it to the last snapshot.
6. > Develop and implement a strategy to migrate file formats, regularly refresh or migrate media formats, and manage recordkeeping metadata.

Benefits

Requires less storage space than taking snapshots of every change to a website.

Organisations can tell exactly what web pages and what content was available on a website at a particular point in time.

Risks

Copies of an entire website, including client-side scripts and other simple dynamic elements, must be maintained over time.

7. > RECORDKEEPING STRATEGIES FOR DYNAMIC WEBSITES

Organisations with dynamic websites should implement one of the following event-driven strategies:

7.1 > ACTIVITY LOGS

Definition

Individual website transactions are captured and maintained.

Technique

1. > Determine the recordkeeping metadata elements that should be captured in a log of individual website transactions (activity log).
For example:
 - Date and time of transaction
 - User profile, including IP address or domain name of user and type of web browser used
 - Web page visited by user
 - Actions performed by users, including searches and queries
 - All objects, including client-side scripts, returned as a result of searches and queries
2. > Establish procedures and processes to ensure the activity log is created and updated. It may be possible to create an activity log from the log file of site visitors used by website administrators.
3. > Routinely capture activity logs within a corporate recordkeeping system.
4. > Develop and implement a strategy to migrate file formats, regularly refresh or migrate media formats, and manage recordkeeping metadata.

Benefits

A full and accurate record of website service delivery is captured and maintained.

Risks

Although web servers generate log files of server activity, they are often confusing and difficult to

decipher. Consequently, it may be difficult to extract sufficient data to satisfy recordkeeping requirements. Where activity logs are created from log files it is important that the activity logs are structured in such a way as to ensure that recordkeeping metadata remains meaningful for as long as the log is required to be accessible.

Most logs of website transactions will contain personal information about the user. You must be aware of, and comply with, the Privacy Act 1993.

7.2 > CONTENT MANAGEMENT SYSTEM

Definition

Content management systems are commonly used to manage large, complex websites that require frequent content revision, often using server-side technology to create web pages on-the-fly.

Technique

1. > Ensure that the content management system has adequate recordkeeping functionality and that this functionality is fully implemented. The Public Records Act Standard S5: *Electronic Recordkeeping Systems Standard* contains functional specifications for electronic recordkeeping systems.
2. > Develop and implement a strategy to migrate file formats (including server-side scripts), regularly refresh or migrate media formats, and manage recordkeeping metadata.

Benefits

A full and accurate record of website service delivery is captured and maintained.

Implementation of a content management system is likely to be less complex than creating and maintaining activity logs for websites (see 7.1).

Risks

Content management systems are typically marketed as publication solutions rather than recordkeeping systems and, despite incorporating version control, may be unable to capture and maintain a full and accurate record of a website over time. Organisations should, therefore, seek to identify the content management system that has the best range of recordkeeping functionality. Alternatively, you may choose to integrate your content management system with your corporate recordkeeping system.

Most logs of website transactions will contain personal information about the user. You must be aware of, and comply with, the Privacy Act 1993.

8. > RECORDKEEPING STRATEGIES FOR E-COMMERCE WEBSITES AND E-BUSINESS SOLUTIONS

Organisations with e-commerce websites should implement the following event-based strategy:

8.1 > ACTIVITY LOGS WITH E-COMMERCE DATA ELEMENTS

Definition

The activity log strategy for interactive websites (See 7.1) is used, but with additional recordkeeping metadata elements for authentication of identity and data security.

Technique

1. > Determine the recordkeeping metadata elements that should be captured in a log of individual website transactions (activity log).

For example:

- Date and time of transaction

- User profile, including IP address or domain name of user and type of web browser used
- Authentication metadata
- Security metadata
- Web page visited by user
- Actions performed by users, including searches, queries, and purchases
- All objects, including client-side scripts, returned as a result of searches, queries, and purchases

2. > Establish procedures and processes to ensure the activity log is created and updated. It may be possible to create an activity log from the log file of site visitors used by website administrators.
3. > Routinely capture activity logs within a corporate recordkeeping system.
4. > Develop and implement a strategy to migrate file formats, regularly refresh or migrate media formats, and manage recordkeeping metadata.

Benefits

A full and accurate record of financial transactions is captured and maintained.

Risks

Although web servers generate log files of server activity, they are often confusing and difficult to decipher. Consequently, it may be difficult to extract sufficient data to satisfy recordkeeping requirements. Where activity logs are created from log files it is important that the activity logs are structured in such a way as to ensure that recordkeeping metadata remains meaningful for as long as the log is required to be accessible.

Most logs of website transactions will contain personal information about the user. You must be aware of, and comply with, the Privacy Act 1993.

Organisations with e-business solutions should implement the following event-based strategy:

8.2 > E-BUSINESS ACTIVITY LOGS

Definition

Essentially the same strategy as for e-commerce websites (8.1).

The difference is that e-business solutions, despite the emergence of open standards for data exchange, are unique combinations of website front-ends and back-end (often legacy) applications. While it is possible to capture the data elements for each transaction as they are transmitted through the website front-end, these elements may be distributed amongst the individual applications comprising the back and front-ends of the e-business solution.

Technique

1. > Determine the recordkeeping metadata elements that should be captured in a log of individual website transactions (activity log).

For example:

- Date and time of transaction
- User profile, including IP address or domain name of user and type of web browser used
- Authentication metadata
- Security metadata
- Web page visited by user
- Actions performed by users, including searches, queries, and purchases
- All objects, including client-side scripts, returned as a result of searches, queries, and purchases.

2. > For each recordkeeping metadata element that is to be captured in the activity log, identify the application in the e-business solution where it is stored.
3. > Determine the most appropriate tactic for managing the recordkeeping metadata elements that relate to a single transaction as a single record, by either:
 - Aggregating the individual recordkeeping metadata elements that relate to a single transaction into a single record. Capture and maintain each record within a corporate recordkeeping system;
 - Or
 - Allowing the individual recordkeeping metadata elements that relate to a single transaction to remain within the applications that make up the e-business solution and link them so that recordkeeping actions (such as assigning identifiers, classifying, and disposing) can be applied to all of the individual recordkeeping metadata elements that relate to each record. This tactic incorporates recordkeeping functionality into the e-business solution. Archives New Zealand's standard S5: *Standard for Electronic Recordkeeping Systems* contains functional specifications for electronic recordkeeping systems.
4. > Develop and implement a strategy to migrate file formats, regularly refresh or migrate media formats, and manage recordkeeping metadata.

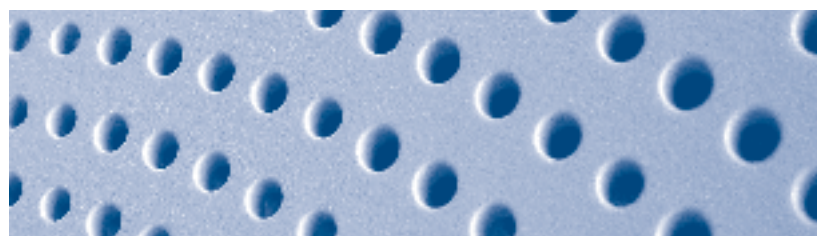
Benefits

A full and accurate record of financial transactions is captured and maintained.

Risks

Integrating recordkeeping systems (or recordkeeping systems functionality) with e-business solutions may be difficult and expensive.

Most logs of website transactions will contain personal information about the user. You must be aware of, and comply with, the Privacy Act 1993.



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ISSN 1176-1172
ISBN 0-478-18212-0