

ILM Survey: What Storage, IT and Records Managers Say

James E. Short

Executive Summary

Storage, IT and records managers hold widely differing views of Information Lifecycle Management (ILM). Based on a survey of 346 professionals completed in February 2006, when asked to define ILM, respondents fell back on what they are familiar with and responsible for. Two-thirds of management policy focused respondents see ILM as policy; technically focused respondents were evenly split between policy and technical definitions of ILM. In terms of costs and benefits, respondents stated that ILM has the potential to introduce a greater number of problems than it can solve. There was a general concern that technology is being thrown at what is intrinsically a soft side issue, namely, management control (agreement) over data, across functions, departments and individuals in the company. That ILM may serve to focus business and technical management to work together to solve the thorny issues of data ownership, data value and communications across the enterprise is to be seen. Without this partnership however, respondents saw little hope that ILM practice could evolve successfully.

Survey Overview

Information Lifecycle Management (ILM) has been much trumpeted and criticized in the industry and trade press. As part of a year long project investigating ILM from the perspective of both vendors and users, ISIC and its industry-based community of practice partner, StorageNetworking.org, completed an exploratory survey of IT and storage

professionals. An online questionnaire was developed and administered on the Internet over a five-week period from January to February 2006. Respondents were drawn from the StorageNetworking.org community, from members of the American Records Management Association (ARMA), and from other storage industry professionals who learned of the survey through postings in industry newsletters. Approximately 3,500 professionals were advised of the ILM survey. A total of 345 respondents completed the Internet questionnaire. All respondents were anonymous.

To ascertain their views on ILM, we surveyed respondents on twelve questions. Seven of the questions were closed-ended. Four asked respondents to identify their professional background, current position and industry; one question asked whether the respondent had been involved in an ILM project; and two questions asked respondents to choose among different definitions of ILM taken from trade and industry sources. The remaining five questions were open-ended. One asked if any other definition of ILM was used in their respective company; two questions asked about the benefits and drawbacks of ILM; and for respondents who were or had been involved in an ILM project, two questions asked about their role on the project and the project's key goals. The survey is reproduced in Appendix 1.

The sample of potential respondents was advised of the ILM survey through email notification and through announcements in two industry newsletters. Potential respondents were encouraged to participate, and provided a link to the survey on the Internet. The survey was designed to take approximately fifteen minutes to complete.

In analyzing survey responses, we used analysis of variance statistics to investigate univariate, bivariate and cross-tabular results. Open-ended questions (text responses) were analyzed using the NVIVO content analysis software package.

How IT, Storage and Records Managers View ILM: Main Findings

The 345 respondents completing the survey represent a cross-section of the storage, IT and records management industry. As illustrated in Figure 1, the largest single category of respondents was Systems Managers / Administrators (18% N=63), followed by IT/IS Management (16% N=54), Consultants (15.5% N=53), Network Managers / Administrators (10% N=33), Sales & Marketing (9% N=32), and Developers (8% N=27). Just over one-third of respondents reported that they were currently involved in an ILM effort within their companies (35% N=122). Over half of this group were either Consultants or IT / IS Managers. Interestingly, 14 Chief Information or Chief Technology Officers completed the survey. Of the CIO/CTOs, 7 were involved in a current ILM effort.

The majority of respondents defined ILM as a policy-based approach to improving records and information management in their companies (52% N=181). Slightly less than half of respondents, however, saw ILM as a technical and systems management issue, addressing the natural progression of improvements in storage systems and software available from the industry (40% N=140). When respondents were asked to rate the importance of topics that are often associated with ILM in trade and industry sources, their responses clustered into two groups. As illustrated in Figure 2, respondents rated Categories 1-3 (Tiered Storage, Storage Resource Management, and Data Archiving) highly. Similarly, Categories 8-10 (Data Protection, Records Management and Compliance) were rated at the top of the one to ten point scale.

The pattern emerging from these responses was that the professionals in our survey were of two

minds – technically focused respondents were split on whether ILM was technical or policy; management and policy focused respondents tended to view ILM as policy. We will comment on this finding more extensively later in the report, but we note here that this finding underscores the point that professionals in the field view ILM in the context of their immediate work responsibilities.

The Benefits and Drawbacks of ILM

We also asked respondents what they saw as the main benefits and drawbacks of ILM. In Appendix 2 we have collected a sampling of responses. We summarize some of the responses below.

Respondents saw the main benefits of ILM as increasing control over data management, insuring regulatory compliance (minimizing risk), and potentially reducing costs (by eliminating inefficiencies in data storage). Specifically, respondents noted:

- “Knowledge and control of valuable, critical company data assets”
- “Regulatory concerns limiting liability, compliance with data retention regulations”
- “Long term cost savings”
- “Ability to manage information in a business value chain context”
- “Opportunity to create consistent, repeatable, efficient business processes for data management”

These benefits were echoed by others who wrote that ILM benefits were tied to improved management control of data, improved policy focus on information, and greater attention (and resources) to the storage systems providing it. For example, respondents wrote that other ILM benefits included:

- “Policy-based storage”
- “Creating a structure for data management”
- “Controlling storage growth”
- “Lower TCOs (hardware, FTEs to manage, faster location of reference date...)”

Conversely, a few respondents felt that there was no immediate benefit to ILM. Rather, they noted that other organizational and systems work needed to proceed it before ILM would have impact. As one respondent summarized:

- “The benefits of ILM are not yet fully available, meaning that adequate organizational and categorization tools that can handle the varying rules of retention and appropriate disposal efficiently” ...are not in place.

The picture that emerges for the benefits of ILM is that respondents felt that properly defined and implemented, ILM potentially could improve management control over data and reduce storage costs. As another respondent wrote, the benefits include:

- “A sense of order and the ability to 'understand' our data so that we don't over-purchase hardware or follow the 'tack on more' methodology when we think we're short.”

Importantly, while respondents cited cost, compliance, management control, and improved policy focus on information as potential benefits, when we asked what the drawbacks of ILM were, several of the same factors surfaced not as benefits, but as drawbacks. Respondents stated that cost, complexity, lack of standards, confusion in the marketplace, and the required up-front investments in process, applications and hardware were all significant ILM drawbacks. Specific drawbacks cited included:

- “Multiple technologies with no overall integrated solution”
- “Heavy focus on technology rather than principles and practices”
- “Very large scope. It means too many things to different people”
- “Initial startup & configuration setup”
- “Upfront analysis of processes, upfront costs of implementing standard processes”
- “Costs, lack of management understanding of the risks and rewards”
- “Cost and the fact that there is no real standard for archiving”

- “Can add complexity. Data can be placed on incorrect storage tier if processes are not followed correctly”
- “Lack of standards to protect a buyer's investment”
- “Difficult to manage. No complete solutions, many vendors attacking pieces”
- “Too complicated to implement”
- “Possibly more things to manage if done incorrectly”
- “No end-to-end solution”

Respondents also noted that potential ILM drawbacks included human resource factors and the difficulties of obtaining commitment across organizational lines. Specifically,

- “Transparency - crosses multiple business units. This makes it a harder sell to management”
- “Difficult to implement. Categorization of data is labor intensive and complicated”
- “1. Time to ramp-up competency 2. Lack of standards 3. Ability to reap benefits along the way”
- “Pushback from the workforce (Employees) and the Unwillingness to change”
- “Too many solutions tie in hardware to what is essentially a soft problem”
- “Lack of 1) Clear, articulate industry definition that companies, and more importantly management, can understand and value. 2) Consistent industry implementation and integration that maps into customer environments”

In the aggregate, our sample respondents saw a greater variety of drawbacks to ILM than benefits. Most often cited drawbacks included complexity of implementation, lack of accepted definitions and standards, and adoption and implementation costs. In the words of one respondent, the management dilemma posed by ILM is:

- “Today, ILM presents a full additional layer of infrastructure and management. Until a company reaches a very high threshold of usage, its TCO is unacceptably high.”

Examples of ILM Projects

For those respondents who are involved in a current or past ILM project, we asked what the project was and their role on it, and what were the goals of the project. These questions elicited a variety of interesting project references, and to capture this variety we have categorized and reported the major project groupings below.

Email, Application Archiving and Repositories

- “Technical assistance in designing an Enterprise Vault project in migrating email and files to lower cost disk”
- “I have participated in setting up an enterprise repository for documents, reports, images and files which is a form of an information life cycle”
- “Lead, implementing ILM for large document repository to store less accessed data on less disk”
- “We are in the middle of a project to pick an enterprise records management solution mainly focusing on electronic data (file systems, database, email). I am involved on the storage solution end of this effort”

Data Center Consolidation, Storage Systems Consolidation, Backup and Restore

- “Data center consolidation and Server/Data storage consolidation”
- “1. Consolidation of all storage use onto a common storage system. 2. A common backup/restore & business continuity approach to all storage”
- “Consolidation of file servers to NAS, and not wanting to take years worth of junk with it”
- “Technical lead for a project just under way to review how we categorize our data and redesign our backup/restore/DR plans”
- “Architecting BURA (Backup, Restore and Archiving) solutions in order to improve data availability and storage efficiency”

Data Classification and Data Migration

- “Develop data classification system to further develop policies around protecting and storing data”

- “HSM project that allowed for data movement from the most expensive disk storage platforms to expire and be moved off to less expensive forms of data storage”
- “We just bought new backup software that has a data migration piece and we are trying it out at the IT department and for approval for corporate implementation”
- “Architect of large project for automatic movement of data based on the average access of data at the block level”
- “I am beginning the process of classifying our data, or, more properly said, working with the data owners to classify it. After classification is done we will be managing it based on what we discover”

Regulatory Compliance (SOX, HIPPA, etc), Records Management

- “Legal advice retention policy - especially electronic forms - i.e. email. When to archive, and when to destroy”
- “Architecting a Sarbanes-Oxley workflow system complete with storage management components”
- “I am the corporate records administrator and came up with the idea of forming a ILM committee with an IT chair. I will serve as the secretary and have the full authority of the law department in the meetings.”
- “SOX related first attempt at DR planning, records management, etc. Technical advisor”

Customer Records Management, Data Warehousing

- “We are implementing a CRM tool to capture, input and centralize all disparate client information. This project will allow us to more efficiently manage our resources and better serve our client base”
- “ILM within the context of CRM (customer relationship management) and contract lifecycle management”
- “Revamping the workflow of customer data – I’m the main stake holder from the system/storage side”

Summing It Up: Interpretation and Implications

The picture emerging from the survey points to the importance of the lack of common definition and understanding of what ILM represents. This includes what activities fall under the ILM banner, how ILM is implemented, and what are the main benefits and drawbacks of ILM. Faced with the question of what ILM is, respondents fall back on what they are already familiar with. That is, respondents define ILM in conjunction with the IT or storage activity they are working on, backup and restore for example, or data classification / data migration, or they see ILM as a management policy issue, potentially one or two steps removed from their immediate work responsibilities.

A second interpretive point is the lack of consistency in identifying the hard and soft benefits and drawbacks of ILM. Factors such as cost, complexity, better access to information and so on, were cited both as potential benefits and as potential drawbacks. This observation suggests that until the ILM message is more consistent and the implementation record more advanced, inconsistencies in stating the potential benefits, drawbacks and costs of ILM will continue.

Third, some frustration with the state of ILM is evident in respondent answers to our open ended questions. There is a view that vendors are attaching ILM “solutions” to existing product offerings, heightening confusion in the marketplace as to what ILM represents and how it can be best evaluated and approached. Several comments were made regarding piecemeal vendor offerings, lack of common approaches and terminology, and the risk of vendor lock-in if a commitment is made.

Conversely, on the user side there is a general concern that technology is being thrown at what is essentially a soft side issue, namely

management control (agreement) over data, across business functions, departments and individuals in the company. The organizational integration needed to produce agreement depends heavily on the strength of partnership between line business management and IT / storage management. That successful ILM practice may ultimately depend on the strength of this partnership is neither positive nor negative. Rather, the question is more whether the needed alignment between business and IT / storage will be successful in user firms. ILM may be surfacing this integration challenge, but according to our respondents, it is too early to say whether the practice will evolve successfully in the face of it.

Next Steps

ISIC will conduct a follow up ILM survey in summer 2006. The survey will build on the results of our exploratory study. Those interested in participating in our ongoing ILM research are invited to contact Ron Durbin or Jim Short.

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About the Author

James Short is ISIC’s Director of Research, University of California, San Diego.

Figure 1 - Which of the following best describes your job? (Question 10)

Q10 Current Job Title	Freq	Percent	Cumulative %
<i>Consultant</i>	53	15.5	15.5
<i>Design/Development</i>	27	7.8	23.3
<i>IT Management</i>	54	15.5	38.8
<i>Network Mgt</i>	33	9.5	48.3
<i>Non-IT Staff</i>	1	0.3	48.6
<i>Other (please specify)</i>	30	8.6	57.2
<i>Proj Management</i>	12	3.4	60.6
<i>Records Mgt</i>	7	2.0	62.6
<i>Research</i>	4	1.1	63.7
<i>Sales & Marketing</i>	32	9.2	72.9
<i>Senior IT (CIO,CTO)</i>	14	4.0	76.9
<i>Senior Non-IT (CEO,CFO)</i>	5	1.4	78.3
<i>Student</i>	2	0.6	78.9
<i>Systems Management</i>	63	18.2	97.1
<i>Other</i>	9	2.8	100
TOTAL	346	100	100

Figure 2 – Following is a list of IT topics that are often associated with ILM projects found in industry. Please rate each topic in terms of how important it is in influencing your own company's approach to ILM. 10 is the highest in importance, and 1 is the lowest. (Question 1)

	1	2	3	4	5	6	7	8	9	10
Tiered Storage, HSM	3.7%	3.2%	4.0%	2.6%	12.1%	10.3%	14.4%	19.5%	16.1%	12/6%
	13	11	14	9	42	36	50	68	56	44
Storage Resource Management	2.0%	2.3%	3.2%	6.3%	15.2%	12.4%	17.2%	18.4%	13.8%	8.0%
	7	8	11	22	53	43	60	64	48	28
Data Archiving	1.7%	1.4%	2.3%	4.6%	7.8%	11.8%	14.4%	23.3%	16.4%	15.2%
	6	5	8	16	27	41	50	81	57	53
Application Archiving	6.9%	6.6%	12.4%	9.5%	19.0%	12.1%	13.2%	9.8%	5.2%	4.3%
	24	23	43	33	66	42	46	34	18	15
DB, Application Integration	2.9%	5.5%	5.2%	6.0%	15.2%	11.8%	15.5%	17.2%	10.9%	8.0%
	10	19	18	21	53	41	54	60	38	28
DB Search, Data Mining	3.2%	5.5%	7.2%	8.0%	11.5%	12.4%	17.5%	15.2%	10.6%	7.5%
	11	19	25	28	40	43	61	53	37	26
Data Warehousing	4.0%	6.0%	8.6%	9.8%	13.8%	10.6%	15.8%	12.9%	10.1%	7.2%
	14	21	30	34	48	37	55	45	35	25
Data Protection, BusinessContinuity	2.3%	0.3%	1.7%	2.9%	6.6%	4.9%	7.5%	20.7%	21.8%	29.9%
	8	1	6	10	23	17	26	72	76	104
Records Management	3.2%	2.6%	3.7%	6.9%	12.6%	11.8%	17.0%	17.5%	12.4%	11.2%
	11	9	13	24	44	41	59	61	43	39
Audit & Compliance	4.3%	2.9%	3.2%	6.6%	8.6%	10.1%	10.9%	16.4%	16.1%	19.3%
	15	10	11	23	30	35	38	57	56	67

Appendix 1 – Survey Questionnaire

Q1. Following is a list of IT topics that are often associated with Information Lifecycle Management (ILM) projects found in industry. Please rate each topic in terms of how important it is in influencing your own company's approach to ILM. 10 is the highest in importance, and 1 is the lowest.

- Tiered Storage Architecture, Hierarchical Storage Management
- Storage Resource Management
- Data Archiving
- Application Archiving
- Database Systems and Applications Integration Across Business Units
- Database Search, Data Mining, Business Intelligence
- Data Warehousing
- Data Protection, Business Continuity
- Records Management
- Compliance and Audit Systems

Q2. What other factors are influencing your company's approach to ILM?

Q3. Which of the following statements most closely matches your own definition of ILM?

- ILM is most importantly an approach to solving the problems of distributed data, database applications, and storage management in the firm, representing a natural progression from storage area networks, tiered storage, and hierarchical storage management (HSM).
- ILM is most importantly a policy-based approach to improving records and information management within the firm, including defining ownership of data, patterns of data access and use, data security, and data archiving
- ILM is most importantly a business application within data warehousing and business intelligence, supporting the linking of warehouse data with customer relationship tools and analytics.

Q4. What do you see as the main benefits of ILM?

Q5. What do you see as the main drawbacks of ILM?

Q6. Are you currently involved, or have you been involved in, an ILM-related project within your company? If Yes go to Q7. If No go to Q9.

Q7. Please briefly describe the project and your role in it.

Q8. What are the main goals of the project?

Q9. Are you a/an:

- IT/IS Professional – Storage User
- IT/IS Professional – Storage Vendor
- Systems Integrator / VAR / VAD / Consultant
- Records Manager
- Analyst
- Member of the Press
- Trainer/Educator/Researcher
- Student
- Other (Please Specify)

Q10. Which of the following best describes your current job?

- Consultant
- Design/Development
- IT Management (Manager IS/IT)
- Network Management/Administration
- Non-IT Staff
- Project Management
- Research
- Sales/Marketing
- Senior IT Management (CIO, CTO, Director)
- Senior Non-IT Management (CEO, CFO, Director)
- Student
- Systems Management/Administration
- Records Management/Administration
- Other (Please Specify)

Q11. How long have you been in your current role?

- 0-1 year
- 1-3 years
- 3-5 years
- 5-10 years
- 10+ years

Q12. Which of the following best describes your organization's industry?

- Aerospace
- Automotive
- Biotech/Pharmaceutical
- Communications / Telecom
- Computer / Technology Manufacturing
- Education Provider
- Entertainment/Hospitality/Travel
- Financial/Insurance/Real Estate
- Government
- Healthcare/Health Services
- Oil/Gas/Mining/Other Natural Resources
- Professional Services
- Publishing/Broadcast/Media
- Retail/Wholesale
- Scientific Research
- Service Provider (ASP, ISP, Web Hosting)
- Software Developer
- Transportation/Distribution/Warehousing
- Utility
- Other (Please Specify)

Appendix 2 – ILM Benefits, Drawbacks

ILM Benefits

- It helps our business sort out a complex issue like record keeping; improved data archiving methods are finally being addressed.
- Archive and cost reductions in primary storage
- Cost reduction. Improved backup times and data retention.
- ILM lets companies manage storage space by archiving data not frequently used, but still retaining access to that data.
- Standardization of planning and implementation
- Data Protection as well as data storage
- Formal strategy for legacy systems
- Better backup/restore and data storage solution.
- Better RTO and RPO while effectively protecting technology investments
- It provides our customers with a reliable archive for their brand product images, literature, and marketing assets
- Having the right information available at the right time.
- Reduction of wasted storage and preservation (and easy retrieval) of important data by policy definition.
- Clearer identification of who is responsible for the data at any given moment.
- More efficient management of information flow - cost savings, time savings (more relevant data is accessed more quickly)
- Ensuring viability of business data over time Proactively identifying and resolving bottlenecks in data access
- Helps focus resources on the most important records.
- Liability reduction, cost savings
- Defining the time at which information can legally be archived from the OLTP system and deleted from the Data Warehouse system.
- Standardizes processes and rules on information created and stored throughout the corporation.
- A true classification system of data that allows for proper protection, storage, retention, and retirement of data.
- Standard deployment methodologies, consistency in budget requirements
- For us, the main benefit will be the process of implementing ILM will force a holistic assessment of our data and processes. The action of categorizing data will also provide us with the first step of implementing a solid DR solution.
- Rationalizing storage procurement
- 1) Knowledge and control of valuable, critical company data assets 2) Regulatory concerns limiting liability 3) Long term cost savings
- Compliance and alignment with costs and value of the data
- Data Protection/Business Continuity
- Cost management by data classification
- Ease of use for IT and scaling.
- Purely compliance related - ISO, SOX, etc.
- Pain-free access to historical data on short notice.
- Proper control of large increases in data files.
- It provides a structured pattern for finding/retrieving information as well as an audit trail of progression.
- Real management of data without relying on end user.
- Decreased back-up time.
- The ability to adopt a common set of business policies to manage our critical data
- Opportunities for benefits within the storage architecture outside and over and above operating system provisions.
- Recoverability, data management
- 1.compliance with data retention regulations 2.ability to manage information in a business value chain context 3.opportunity to create consistent, repeatable, efficient business processes for data management
- Recovery of storage and management resources. Standardized policies.
- Allows use of cheaper media and/or disk for less critical data, reins in growth of storage and helps meet backup windows easier.
- Instant visibility of all information storage irrespective of operating system hosts. Higher level abstraction with a wealth of historical information that is highly useful in both forensic, and trending analysis.
- Cost savings and performance
- The ability to understand how data is used and to be able to track it from creation, to update, to archive.

ILM Drawbacks

- Without policy based migration you can't do much with ILM and building those policies is a huge undertaking both from a definition and a data ownership standpoint
- Costs. Non-integration of products. Lack of good products.
- Excessive administration / paperwork
- Constant upgrading and technology issues
- Complexity of implementation
- Multiple technologies with no overall integrated solution.
- Not being implemented completely
- Increases the complexity of business initiatives.
- Obsolescence
- High administrative overhead.
- Resources, people time, money, disk space
- Complexity of policies and monitoring of additional hardware can add a lot of admin overhead.
- Transparency - crosses multiple business units. This makes it a harder sell to management.
- Time and resources are required to properly plan it; sometimes difficult in a smaller faced-paced organization.
- Cost and complexity
- Complexity, especially in establishing policy.
- Heavy focus on technology rather than principles and practices
- High overhead in terms of cultural change and the need for good metadata.
- Time/staff constraints, lack of "buy in"
- The main drawback is identifying data owners who will take responsibility for saying when information can be deleted/purged.
- Keeping access to data current with future technologies
- Number of products needed - COST!!!
- Very large scope. It means too many things to different people.
- Upfront analysis of processes, upfront costs of implementing standard processes
- Lack of interoperability
- Complexity. Lack of one vendor that does all ILM well...
- COST of implementation and the lack of mature tools for managing the migration of data.
- 1) Clear, articulate industry definition that companies, and more importantly

- management, can understand and value. 2) Consistent industry implementation and integration that maps into customer environments.
- Lack of standards to protect a buyer's investment
- Complexity in setup and cost
- Too many solutions tie in hardware to what is essentially a soft problem.
- Compatibility of hardware and software from different companies.
- Cost and complexity of implementation - not a quickie fix - needs analysis of organizational priorities.
- Additional capacity and an additional application layer to provide resource management
- Upfront investment in process and applications.
- Difficulty in gaining cooperation from data owners required to perform analysis. There is no automated tool available at present to draw attribute information from data across the major DBMS's
- Different approaches, immature product offerings, additional complexity.
- Not mature as a standard. No real standard for the term.
- This is nothing new. ILM was around on the mainframe years ago, in some form as HSM for archiving based on reference data, allowing some of the functions ILM has today.
- Vendors marketing ILM as technology to solve business needs, rather than their hardware/software being a way to execute business policies (but the business needs to define policies first)
- Initial complexity and lack of mature business processes to match the technology, migration of legacy systems, initial cost
- Immature technology. No one vendor has all the answers in terms of a software solution.
- Hard to get buy in from users, risks of letting data roll off.
- Another audit point that can add to cost.
- Lack of standards for policies. Each customer implementation is different. Executive education is also a problem. "Store everything forever" is a common directive.
- Trying to get everyone on the same page, up front cost
- Getting there

About ISIC

The Information Storage Industry Center (ISIC) at the University of California, San Diego is a university-based, management research program studying the business applications and economics of advanced storage technologies in the modern information-intensive corporation. ISIC's program areas include industry studies (competitive dynamics, product innovation and manufacturing, industry structure), business innovation and applications of advanced storage systems (data management, data mining, distributed information management), and the management of storage as an integral part of the firm's IT business resource. ISIC works closely with the Center's StorageNetworking.org community of practice in conducting industry facing, direct observation research.

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ISIC STAFF

Roger Bohn, PhD, Director
James E. Short, PhD, Research Director
Ramaiya Balachandra, PhD, Visiting Researcher
Ron Durbin, Director of Industry Relations

CONTACT INFORMATION

Information Storage Industry Center
9500 Gilman Drive, 0519
La Jolla, CA 9203-0519
Telephone (858) 534-9825
Fax (858) 534-3939
E-mail: isic@ucsd.edu
<http://isic.ucsd.edu>

