ENTERPRISE STRATEGIES AND SOLUTIONS

Intranets

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Complexity Theory and Intranets

TOM REAMY

The initial reaction of most readers, upon seeing these two ideas—complexity theory and intranets—conjoined, might be described as befuddlement, promptly followed by the question, "What does this have to do with my job and my intranet?" Well, I'll argue here that some very interesting implications result in both theory and practice when you consider them together.

Complexity theory is an interdisciplinary method that can be applied to a wide variety of subjects, including math, artificial intelligence, economics, ecology, and so on. The Santa Fe Institute is one focal point for a lot of new research. In addition, there is a growing field of complexity theory and social research, with David Byrne, senior lecturer in social policy at the University of Durham, as a leader.

In essence, complexity theory deals with complex systems, which are quite different from complicated systems or chaotic systems. In a complex system a large number of relatively independent and dumb elements interact according to a small set of rules. Then, if the system is set up correctly (by human designers or evolution), self-organizing behavior begins to emerge out of the simple interactions. All rules and interactions are local, but a global order emerges.

To get a basic understanding, let's look at two examples of complex systems taken from a good, popular book, *Emergence,* by Steven Johnson:

Ant Colonies: Ants exhibit amazingly complex behaviors without anyone in charge. They have a few local rules (if too many of your fellow ants are near you doing something, go somewhere else and do something else), and out of these simple rules arise very complex global actions, such as efficiently clearing an entire tunnel system without any ant having any idea whatsoever about how to clear a tunnel.

City Neighborhoods: Neighborhoods organize themselves in cities without a central planner telling them how to do it. Unlike the ants'actions, these are conscious choices. But like the ants, individual store owners have no idea how to structure a city neighborhood.

TWO KEY IDEAS

Two key ideas underlie the ability of complex systems to self-organize and have significant implications for intranets and complexity theory: the importance of the environment, including the design of the basic rules that govern how the individual agents will interact; and having an evolutionary or feedback mechanism that will ultimately drive the system.

Without an environment, nothing evolves. The structure of the environment is critical, determining not only who will survive, but what rules will evolve. In the example of neighborhoods ordering themselves spontaneously, there was an environment made up of zoning laws, streets, an information system that included telephones and newspapers, other infrastructure elements such as water and sewage, and so on.

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Collaborative Taxonomies Revisited

JEAN GRAEF

The issue of corporate taxonomies—systems for naming and organizing things that share similar characteristics into groups—first appeared on Montague Institute members' radar back in 1999. At that time, we convened a roundtable to explore a collaborative development effort in which different companies, possibly in the same industry, would share the costs of creating taxonomies everyone could use.

As it turned out, a cooperative joint venture for corporate taxonomies was neither feasible nor necessary. In the first place, companies can license taxonomies from many sources including publishers, professional associations, and software vendors. In the second place, corporate information and the taxonomies used to organize it are viewed by most companies as key intellectual assets to be used for competitive advan-

Collaborative Taxonomies Revisited continued on page 2

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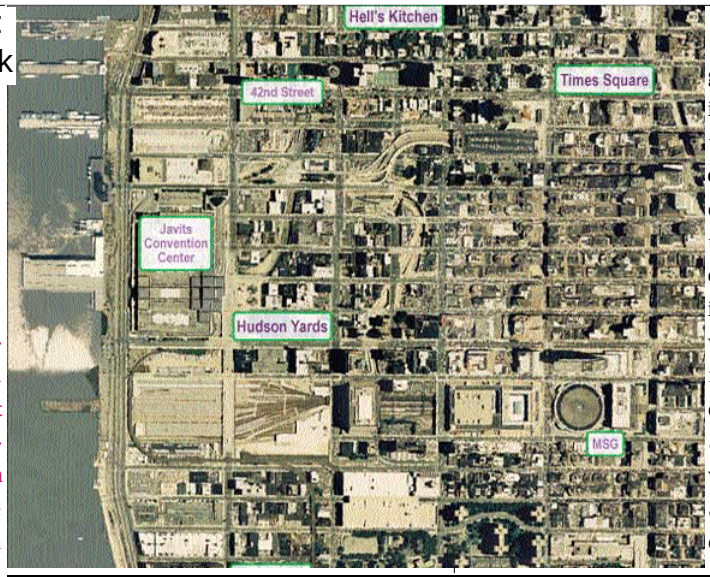

Clearly there was a lot of infrastructure order in New York, including streets and blocks.

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In addition to the environment, there needs to be an evolutionary feedback system. In this case, there was an economic system that rewarded certain decisions made by individual store owners (like locating near similar stores), and a universal measurement standard: money.

COMPLEXITY RUN AMOK

OK, that's probably enough theory, but what does it all have to do with intranets? In many ways, intranets provide a perfect example of a self-organizing system gone mad. There is no central control, everyone puts up anything they want anywhere they want with user interface designs that range from the bizarre to the truly tortuous. Consequently, no one can find anything.

In other words, intranets are actually a self-disorganizing system. However, if we think about intranets from a complexity theory perspective, the first thing we notice is that most intranets are complicated and chaotic, but not complex. We need to ask what it would take to turn them into a complex system that might be capable of self-organizing behavior.

First, they need more structure and, along with it, a better understanding of that structure. This includes not only standard site maps and browse taxonomies, but also a real taxonomy of content subject matter and a rich systematic metadata description of the content. The structural description needs to look beyond that of Web sites to more basic units of organization like documents and taxonomy nodes.

There are a lot of good reasons for having such a rich structured description of our intranets; this description is essential if we are to apply complexity theory to intranets. However, we need more. We need to have a better description of the activities associated with the content and a very good, deep categorization of the users accessing that content for their various purposes. Since we don't have the luxury of waiting for evolutionary time scales necessary to develop rules appropriate to an intranet environment, we need these taxonomies of content and activities, and we need people to design our rules for business time scales.

The need for this deep understanding of intranet environments is especially evident when we turn to the next key idea: evolutionary mechanisms. If an ant fails to follow a rule or if a store locates itself in a bad neighborhood, they die. When a Web site creates a bad design or hides its content in inappropriate places, usually there is no consequence whatsoever. What is needed is some way for the system to regulate itself. It needs feedback if it is to evolve and change in relation to its neighbors and its environment.

One possible mechanism is to set up a simple evolutionary mechanism based on number of clicks or total usage, killing content that falls below a minimum. This has the advantage of using a universal, objective, easy-to-measure currency. One essential reason stores were able to self-organize is that the economic system valued their actions with a universal measure: money. Unfortunately, we know from experience and from Google that simply counting clicks or links has some serious flaws and that popularity does not directly correlate with value. And, of course, there is the political issue: what do you do when the Web site of the CEO is slated to be dropped?

It seems clear that there is no ready-made evolutionary mechanism that we can just sit back and monitor as our intranet evolves and organizes itself. We need additional research into types of mechanisms and at least in the beginning, a central intranet group whose job it is to apply and evaluate the various sets of rules.

Let's look at a theoretical example to explore how this might work. We can start with a collection of documents and develop an initial categorization of the content. Instead of the simplistic click-counting, let's track user behavior through the documents, paying particular attention to sequences of document types. What we might look for are candidate rules of various kinds. One promising type of rule is the kind found on ecommerce sites like Expedia: the fly-sleep-drive rule. This rule states that when someone makes a plane reservation, there's a good chance they'll also need a hotel reservation and a rental car, so you automatically offer them a path that supports their predicted behavior.

On an intranet, the possible relationships are much more varied and complex and almost certainly cannot simply be determined *a priori*. So we might begin by taking our categorization of content, following how it is being mapped to our taxonomy of activities and users, and create a series of road maps through the content based on common connections. Once we have a set of candidate rules and other ways of clustering documents and document trails, we can then evolve the system. We'll use the amount of traffic and clusters of users we have tracked to suggest next steps, which will feature the most heavily used trails for each identifiable cluster of users. There are a whole range of possible applications for this approach including navigation, search, and a more powerful personalization mechanism for portal, to name but a few.

WHAT IS IT GOOD FOR?

It is important to recognize that the approach proposed here lies somewhere between complexity theory as a metaphor and an actual application of the math of complexity theory. Since this method won't lead to a self-organizing intranet directly, you may question its value.

Keep in mind, however, that the research into what it would take to apply complexity theory to an intranet reveals a great deal in itself. By investigating what would be need-

ed to turn a complicated intranet into a complex system, we will gain insight that we can apply without having to implement a full-blown intranet-based complexity theory. We can gain a fresh perspective on the need for taxonomic structures and metadata, the role of a central management team to establish and monitor the intellectual environment of the intranet, and especially the need for and justification for better metrics of use.

Additionally, complexity theory can provide an element that is often missing from intranet management: a theory of intranet structure and development that can provide some insight and guidance. It is not an overall theory of intranets, but it has a theoretical depth and rigor that can provide new ideas and most importantly, ideas that can be evaluated through direct measures of orderliness as well as better ROI stories.

Lastly, if we define our intranet team so that their task involves more intranet evolution than management, we could develop intranets that are not only better designed but also cheaper to maintain than they are using any of the current management models, which are based largely on an Internet model used by the masses of independent Web sites, They are costly and messy to maintain, not to mention difficult to use.

Evolving an intranet and its organization is not only doable, but potentially a lot of fun and very rewarding. With complexity theory, the central team can, in essence, "play God," creating the initial conditions and rules of the intranet universe, and then tweaking the evolution of the system. After all which would you rather have as a job title: Intranet Manager or Intranet Deity? I

TOM REAMY (tomr@kapsgroup.com) is chief knowledge architect for KAPS Group, a group of knowledge architecture, taxonomy, and elearning consultants. He writes for *Knowledge Management*, *Intranet Professional*, and *KMWorld*, and is a frequent speaker at KM conferences.

Read_Me_File

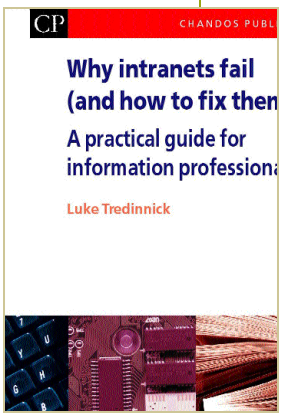
MARTIN WHITE

PRINT AND DIGITAL RESOURCES

Why Intranets Fail (and How to Fix Them)

A Practical Guide for Information Professionals

Luke Tredinnick.
CHANDOS PUBLISHING
$55



The author of *Why Intranets Fail* has been an intranet manager and is now a senior lecturer in digital information management at the London Metropolitan University so the book combines practical experience with academic thoroughness.

The first section of the book looks at the ways that organizations work and the way that people react with intranets. In the opening chapter, the author sets out six categories of intranet user and comments on their implicit and explicit expectations of an intranet.Why organizations behave irrationally in their expectations of intranet success and in Chapter 3,the author works to reconcile these competing expectations.The second section of the book explains how to organize design and manage intranets that are both user-centric and organization-centric.There are step-by-step guides on how to implement an intranet and how to manage an intranet. The final chapter covers the need to anticipate change.

On balance this is a very recommendable book,though in quite a number of areas the author does rather skim over issues without really getting into sufficient detail to be truly helpful.The Web resources at the end are also somewhat thin and omit several of the thought leaders in the intranet space.

Search Tools for Web Sites and Intranets

Avi Rappaport
WWW.SEARCHTOOLS.COM

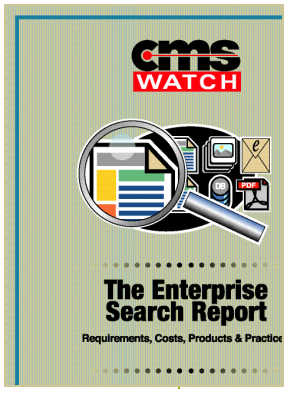
This site is managed by Avi Rappaport, a leading consultant on search engine selection and implementation. The Search Tools site is the place to track down information on just about any search tool. There are over 200 search products profiled on the site, which sets out the main features of each and provides links to published references. There is also a section on obsolete products that is more useful than might seem at first glance given that search software has quite a long shelf life. The site also contains excellent sections on how to specify a search product and lists reports,books, and articles on search-related topics.

Once you set out to provide a comprehensive list such as this, the effort involved in maintaining it is colossal, especially if you are running a consulting business at the same time. The inevitable result is that some of the information is not as current as it might be, but the listings and the selection and implementation advice is of such value that I still regularly turn to this site.

The Enterprise Search Report.

Requirements, Costs, Products and Practices.

Steven Arnold
CMS WATCH
$1,250



If there have been few books on intranets,the literature on search software is almost non-existent.All credit to Steve Arnold,the author of this report, and Tony Byrne, the publisher, for combining their talents to produce what is without any doubt the definitive report on enterprise search.A great deal has been written about content management but the focus is usually on getting content into a CMS and then publishing Web pages. Until The Enterprise Search Report,the requirements of searching across enterprise repositories of all types have not been examined in any depth.

The main sections define enterprise search is and how it works,making a business case for an enterprise search applications and outlining requirements.It offers profiles and assessments of nearly 30 vendor, and advice on how to select and price a solution.The 475 page report must include 200,000 words of the utmost erudition.Of particular note are the vendor profiles, each of which is about 10 pages and presents not only a detailed account of search engine features but also an invaluable perspective on their strengths and weaknesses.I would have liked to see a more extended section on open-source software, as many organizations are now more disposed to use these solutions.

The single user price is $1,250,and there are team and intranet pricing options available.Expensive? Look at it this way: That money would only buy you a few hours of a consultant of Steve Arnold's caliber. The report represents months of work and years of experience and can transform information access in your organization, which adds up to being well worth the price.