

**From the Dust: Developing effective content  
management workflows after a systems change**  
Combining theories to solve problems

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## **INTRODUCTION**

Keeping up with the rapid advancement in technology can prove to be a difficult endeavor for anyone, but for large enterprises with competing priorities on their plates, changing their Intranet environment from an HTML-only environment to a SharePoint environment takes more than just a software upgrade, it requires changes in processes, workflows, and network roles for those who manage the Intranet's content.

In this essay, I will examine a large health care company that in 2012 will be moving their current, HTML-only Intranet to the SharePoint 2010 platform. This new platform will drastically change the process of how content on the Intranet is managed by its users. An examination of the current processes and roles is necessary to assist in the design of the new content management workflows and policies.

This essay begins with an examination of the current system; how content is managed, the roles of those involved, and the challenges found therein. Then I use a combination of theoretical aspects from Distributed Cognition and Activity Theory to frame the problem space, and apply their strengths. Finally, I summarize my findings in order to make recommendations on content workflow management for the future system.

## **BACKGROUND**

The current content management network (here, referred to as CCMN) consists of the people who manage the system and the mediating artifacts that support that work. Content on the Intranet is siloed by department, which creates use problems since it requires the user to know which department owns the content they are looking for. Compounding matter is that there are multiple hand-offs that take place in order to get information added or changed on the Intranet. If a user wants to update content, they need to email whomever they believe to be the content editor of the page by searching through the names mentioned within the page content, footer, or

headings. If the receiver of the request is not the content editor, they must try to solve who is and the process begins again. Because the content editor is not always the owner, they must get content updates signed off on by the owner before the content can be updated.

In the CCMN, the role of the content editor is unclear in part because there are so many working titles for content editors. Here, working titles are not specifically tied to ownership and wildly vary throughout the system: section manager, web content developer, subject matter expert, technical writer, and content manager all have some ownership of the content, but their ability to effect change in the system varies from person to person due to system access, experience, and the tools needed for change. This causes the content change request to go through a series of hand-offs in order for the change to arrive on the Intranet. The time it takes for the change request to get to the person who can make the change creates logjams and delays content updates, which harms the user and the company's customer since the Intranet's main use is to inform users of the policies and procedures that support customer care.

To better understand the current process for content management on the Intranet and create a new workflow design for the upcoming system, I applied Distributed Cognition (DCog) and Activity Theory (AT) as a framework for understanding the problem space.

## **THEORETICAL FOUNDATIONS**

**Distributed Cognition**, or DCog was born from cognitive theory as a response to the growing need to examine environments that are enriched with new mediums for supporting interactions that occur at the human to human level, such as those which exist during the coordination of activities needed by a Naval ship's crew, and the systems supporting them to navigate their ship into port, as examined by Hutchins (1995). DCog extends cognitive theory beyond the individual mind to include systems, groups, and human/system interaction in its analysis - "Analysis of systems using distributed cognition permits the inclusion of all of the

significant features in the environment that contribute toward the accomplishment of tasks” (Perry, 2003), thereby allowing the researcher to look for answers to questions that were previously not found in cognitive theory, for example, how does the ship’s crew coordinate activity to steer the ship, contact the port, not hit other boats, and drop anchor in the correct location?

There are three tenets of DCog that help examine this phenomenon 1) cognitive processes are socially distributed across members of a group, 2) cognition is embodied in the sense that work materials can become elements of the cognitive system itself, and 3) the study of cognition is not isolated from culture, as systems we produce as humans to problem solve are influenced by our cultural and outward experiences (Hollan, Hutchins, & Kirsh, 2000). DCog declares that the boundary of cognition goes beyond the individual’s skin and skull to include the tools and the cultural environment in which an individual is situated.

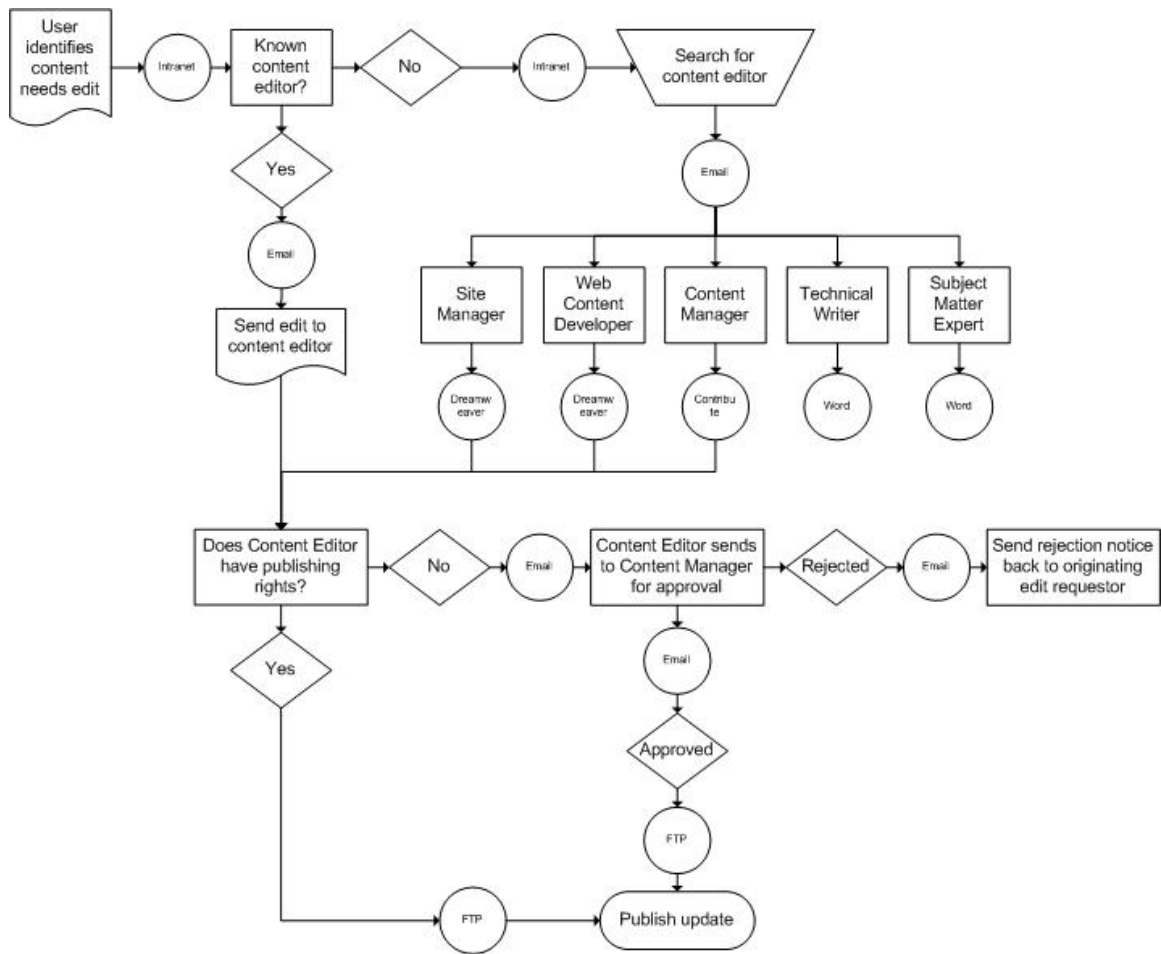
**Activity Theory**, or AT was developed by the Russian psychologists Vygotsky, Rubinshtein, Leont’ev among others in the 1920s and is used in HCI to help inform and evaluate system design. AT includes five basic principles: 1) hierarchical structure of activity, 2) object-orientedness, 3) internalization/externalization, 4) tool mediation, and 5) development. *Activities* are oriented to motives and each motive is an *object*, material or ideal, which satisfies a need of the *subject*, and the actions of the subject support the activity for the subject to reach the end goal. According to AT, the computer is just another tool that mediates the action of the subject to reach the end goal (Kaptelinin, 1997).

## **COMBINED THEORETICAL APPLICATION**

Combining the theoretical aspects of DCog with AT allows me to use attributes of both theories that work well to frame the problem space. For example, AT has a built-in diagramming technique that help keep the system analysis in the foreground, creating a useful artifact that

provides both descriptive and rhetorical power (Halverson, 2002) for approaching problem solving exercises that involve the CCMN’s key stakeholders in the preparation for the migration to the new platform. DCog on the other hand is useful for providing insight to how the CCMN is functioning between collaborating actors in the system. DCog also helps keep history, culture, and context of use in the foreground to ensure that future workflow changes are built based on the efficiencies of the heuristic findings in the past system.

The utility of DCog combined with AT is their theoretical commitment to examine this broader socio-cultural-technical system, which is necessary for the collaboration between individuals in the CCMN when mediated by artifacts (Halverson, 2002).



**Figure 1: The workflow of the CCMN**

To analyze the key issues in the current system, it is necessary to first unpack the CCMN. To do so, I used Activity Theory to diagram the CCMN workflow (fig. 1). In this way, we can see the multiple steps and supporting artifacts that are used to get updated content posted to the Intranet. In the CCMN workflow diagram, actors are squares and circles are the supporting artifacts. Here, the complexity of the system becomes apparent and the need for removing waste is brought to the forefront of the problem.

In the CCMN, knowledge is distributed amongst individuals using word or mouth, email systems, instant messaging, handwritten notes, and static Intranet content in the form of policies and procedures. The individuals mediating the knowledge act in roles that may be titled the same but have differing levels of content editorship. For the new content management network to run more efficiently, 1) system roles and responsibilities need to be defined and equalized to reduce user confusion, 2) the content workflow must be reduced to fewer steps, eliminating waste and lag time for content updates, and 3) the system itself must change to allow for these processes to become more effective.

The first step in developing a new system workflow is to define the roles and responsibilities in the workflow. The system works in four capacities, the actor or individual who is involved in the process, their role within the workflow, their right to act within the system, and the step in production which with their role interacts (fig. 2).

Standardizing roles allows each actor to understand their place in the system and how they can best affect change. The user also benefits since their cognitive load is lessened by not having to remember specific actors in the system, but instead the role of the managing editor.

<b>Actor</b>	<b>Role</b>	<b>Rights</b>	<b>Step in production</b>
Content Manager	Acts as an advisor to the Subject Matter Expert	Manages content	Pre and post production
Subject Matter Expert	Writes content and approves changes	Writes content	Pre and post production
Technical Writer	Edits content before being published to the Intranet to assure it meets user requirements	Edits content	Pre production
Section manager	Completes design, architecture, and layout of Intranet site, and acts as an advisor to the Web Content Writer	Manages design	Pre and post production
Web Content Developer	Publishes content to the Intranet	Publishes design	Post production

Figure 2 Defined system functions

Applying these attributes from both DCog and AT, allows the workflow to be examined at a system level, which makes clear the objectives for the actors in the system. Here the main objective is to update Intranet content. This process must be simplified to ensure that subjects achieve their goal in an efficient manner. In an ideal world, the requestor can have their updates to the Intranet applied without the need for multiple handoffs. In reality there are rules and bounds that are in place to keep content easy to access, internalize, and apply to support staff work processes and procedures. To keep these rules and bounds from overly constraining the new Intranet platform, a new approach must be taken to the content management workflow.

## **FINDINGS**

### *The Distributed Content Management Activity System*

Before beginning this analysis, I knew that updates to the web occurred inefficiently, however I wasn't sure of the root cause. Using DCog and AT to examine the process has allowed me to take a systematic look at the problem space, and consider not only the human actions in the system, but also the system that mediates those actions. It is my hope that my findings from this

process will enable my team, along with the Intranet management staff to build a simplified workflow that supports the user and their end goals.

In the new content management environment, SharePoint can be set up to enact standard workflows, therefore, when a user identifies a content need, they can go into edit mode and change the content. The change is held in draft mode until the assigned content editor for the site either approves or denies the change. Once these workflows are established, they will greatly reduce waste and simplify the needed content management network actions for both the system actors and the users of the system.

## **SUMMARY**

Analyzing a system workflow using DCog and AT allows researchers to go to the macro level of the problem, categorically examine the roles and responsibilities of both the human and machine actors in the system, and discover ways to standardize the system in order to reduce inefficiencies and apply improvements that keep history, culture, and collaboration in mind. Another benefit can be found in the naming of things within the system. Assigning names and definitions to system roles allows for a common language for those working in the system, and removes gray areas of the system attributes or network knowledge.

In Love's article (2002) on design, he argues for a unified body of knowledge about designing and designs, and that definitions and core concepts are key to developing a unified body of design theory, and much like the CCMN "core concepts are given definitions that are: too broad, too narrow, inappropriate, ambiguous, multiple, inconsistent, and different" (353). Resolving this problem in both design and content management requires tightening definitions/descriptions for the actors that work in the system.

Traditionally, theoreticians argue over the weaknesses or strength found in the different theoretical camps, while the truth may lie somewhere in-between. Applying the attributes found



amongst multiple theories, allows for a more flexible theoretical toolbox and problem solving amongst a vast field of problems. While DCog nor AT alone may be the answer to solving deep workflow problems in the workplace, I have found it useful to apply some of their individual attributes from both theories to map the problem and discover solutions for my team.

## **WORK CITED**

Halverson, C. A. (2002). *Activity Theory and Distributed Cognition: Or What Does CSCW Need to DO with Theories?*. *Computer Supported Cooperative Work*, (11), (p. 243-267).

Hollan, J., Hutchins, E., & Kirsh, D. (2000). *Distributed Cognition: Toward a New Foundation for Human-Computer Interaction Research*. *ACM Transactions on Computer-human Interaction - TOCHI*, 7(2), (p.174-196).

Kaptelinin, V (1997). *Activity Theory: Basic Concepts and Applications*. CHI '97 Proceedings. Accessed 31 May 2011 < <http://www.sigchi.org/chi97/proceedings/tutorial/bn.htm>>

Love, T. (2002). *Constructing a coherent cross-disciplinary body of theory about designing and designs: some philosophical issues*. *Design Studies* (23), (p. 345-361). Edith Cowan University.

Perry, M. (2003). *Distributed Cognition*. In J.M. Carroll (2003) *HCI Models, Theories, and Frameworks: Toward an Interdisciplinary Science* (p. 193-223). Morgan Kaufmann.