

Abstract

The theme of this case study is that in complex adaptive systems (CAS's), a minimalist design approach can accomplish a great deal with less cost and risk compared to a more comprehensive approach based on reductionist systems principles.

The focus of the case is a consumer co-op with over 3 million members and several dozen stores. The author was hired to be the "change management consultant" for the implementation of "omnichannel" software. The software objective was to enable members/customers to purchase products and services rapidly and easily regardless of the device(s) they used. This project occurred at the same time as process improvement to enable product design, marketing, and operations to conduct marketing campaigns and publish content on the web with (both) significantly more autonomy *and* collaboration.

The omnichannel project was one of five simultaneous software implementations, including Enterprise Resource Planning (ERP) and (Human Capital Management (HCM), at the same time three new stores were being opened. Plus other process improvement projects were also underway. And, agile development methodology was being employed for the design and development of the omnichannel software.

Two minimal organizational changes emerged with the potential to significantly improve the effectiveness and efficiency of the omnichannel project, and also to enable business process changes that would achieve the desired increases in autonomy and collaboration. These minimal changes were implemented and the desired results unfolded.

The presentation will engage Roundtable participants in applying CAS theory to understand what took place in this case, and to consider if and how CAS theory applies to their work or program of study.

Case Study

What is a Complex Adaptive System?

Reading the STS Roundtable program, it's striking how many times the terms "systemic approach" and "systemic work design" are used. What do these terms mean? And how do different ways of thinking about systems impact organization and work design?

When I started consulting to organizations in 1984, one of the bibles for organizational studies was *The Social Psychology of Organizations* by Daniel Katz and Robert Kahn (1978). Based on the systems theory zeitgeist of the times, Katz and Kahn built a thorough framework for interpreting human behavior in organizations. Their description of systems theory is consistent with the frameworks used by the Tavistock pioneers and their immediate direct descendents. I believe this concept was prevalent in most of the process improvement methodologies such as TQM, Reengineering, Lean, and Six Sigma. I believe that this conception of "systems" is still the most common framework. But, starting in the early 1990's with Meg Wheatley's publication of *Leadership and the New Science*, another broad conceptualization of systems theory has emerged. One useful label for this new framework is Complex Adaptive Systems. While quite a few authors have attempted to bring this new understanding of systems to organizational studies, it's my impression that this is a work-in-process and isn't at the level of consensus there was for the older framework. So, the main purpose of this case study is to provoke dialogue about the usefulness of the CAS framework, since it seemed like it worked well in this situation and others I'm working with and in.

For the purpose of this case study, it's useful to compare some of the defining characteristics of Complex Adaptive Systems the way I understand them with the way "Systems Theory" was understood in the 1980's, as set forth in the following table. (The facets in the table are the ones I've found most useful to compare the two frameworks. Quite a few other facets can be used and please name the ones you think are important and missing, or are better to describe either or both frameworks.):

| Systems Theory as understood and used in 1980-2000 | Complex Adaptive Systems |
|--|---|
| <u>Linear Change</u> : Implicit assumption that bigger changes require larger interventions. Design Teams of 20+ members not uncommon. | <u>Non-Linear Change</u> : Large changes in input may lead to small changes in outcome and small changes of input may lead to large changes in outcome. |
| <u>Planned Change</u> : Methodologies supporting large-scale changes assumed weeks of assessment followed by months of design followed by months of planning, all required before anything was implemented. | <u>Iterative "Agile" Changes</u> : A series of incremental evolutionary changes. Learning from each change impacts following changes. "Current State" assessment may not have any value. |
| <u>"Change Targets"</u> : Despite participative design theory, common practice of large-system change typically focused decision-making and initiative in hierarchical structures. | <u>Self-Organizing</u> : Constant re-organizing to fit the current environment, induced not by a single entity but rather by the simultaneous and parallel actions of agents within the system. |
| <u>Primacy of Design</u> : The ways work processes and roles are defined have primary influence on the way work is done. Work and role structures are primary causes of outcomes. | <u>Primacy of Relationships</u> : The ways people relate to each other is critical to the way the system functions. The focus of CAS is on relationships versus design causality. |
| <u>Primacy of Environment</u> : Assumption that successful organizations conform to and follow the "rules" of their dominant environments. E.g. Porter's Five Forces and Value Chain models. STS "environmental scan." | <u>Co-evolution</u> : Any change in any agent may cause change in the environment. "A butterfly flapping wings in Lima, Peru influences weather in Peru, Indiana." E.g. disruptive organizations like Uber. |
| <u>Bureaucratic Rules</u> : Complex organizations require massive and comprehensive processes and procedures to function effectively. | <u>Simple Rules</u> : Complex adaptive systems are not complicated with respect to rules. They are characterized by flexibility and varieties of options. |
| <u>Dynamic Equilibrium</u> : This is the desired state of a healthy organization. "Balance" and "optimization" have positive connotations. | <u>Edge of Chaos</u> : Systems in equilibrium are dying. Systems in chaos cease to function as a system. The most productive state of any system is on the edge of chaos. |

What is Minimalist Design?

Web searching this term finds that most entries refer to the *outcome* of the design process. I would like to use the term to refer to the design *process* itself as well as its outcomes.

In his work on STS Design Principles (Some Principles of Sociotechnical Systems Analysis and Design, 1992) Eli Berniker built on earlier work by Albert Cherno (Principles of Sociotechnical Design, 1976) in describing the principle of Minimum Critical *Specification*: "This principle has two aspects, negative and positive. The negative simply states that no more should be specified than is absolutely essential; the positive requires that we identify what is essential. (Cherno, 1976). A pervasive fault of much design is the premature closing of options. We over design both to reduce uncertainties and to insure that we get our own way. Minimum critical specification means that we design as little as possible and only specify what is essential....We never have sufficient knowledge or control to completely specify a work group design....Whatever optimal benefits we could hope to achieve through specification would become obsolete rapidly as tasks, challenges, and problems changed. Over specification would then cripple the adaptive capabilities of the work group."

This is a good starting point. Eli's use of the term "minimal" focuses on specification; what IT designers call "requirements." While related to this concept, I'm using the term even more broadly – to describe the *actions* taken by people who are involved in designing work and organizations as well as the *changes* that are introduced.

So I'd like to define *minimalist design* for this purpose as "taking few actions, each utilizing little apparent energy, applied to points in the system where significant leverage can be expected, and resulting in small changes that have large effects – hopefully positive."

What Happened in this Case?

Background:

The focus of the case is a consumer co-op with over 3 million members and several dozen stores. The author was hired to be the "change management consultant" for the implementation of "omnichannel" software. The software objective was to enable members/customers to purchase products and services rapidly and easily regardless of the device(s) they used. This project was occurring at the same time as process improvement to enable product design, marketing, and operations to conduct marketing campaigns and publish content on the web with (both) significantly more autonomy *and* collaboration.

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As Is, To Be, or Not To Be Process Maps:

As is unfortunate but not uncommon in the world of systems projects, the statement of work (SOW) was written by a sales person with little understanding of the actual work that needed to be done. The SOW called for "Business Process Maps" to be produced by the third week of the project. Fourteen processes were involved. In our first meeting with the CIO we told him this was not a realistic expectation. He smiled and told us, "too bad, it's in writing. We got ripped off by our last consultant and we won't make that mistake again."

This problem turned into an opportunity, when (1) we established a working partnership with the consultant assigned to facilitate the "One Team" process improvement (see next section); (2) together we found the fourteen "As Is" maps developed by the previous consultant, buried in a storeroom; (3) we commandeered a huge centrally-located table, spread out the maps, and engaged marketing and operations staff informally in dialogues asking "what's right and what's wrong about these maps; and how will they change when the new software is being used." After a week of informal dialogues, the One Team consultant and I facilitated four two-hour meetings (10-15 participants each) where participants decided which process changes were "directionally where we want to go."

The CIO and Omnichannel IT Project Managers agreed that the output of this exercise – which was finished in three weeks –fulfilled the SOW deliverable. The key to this approval was their recognition that engaging the participants in productive dialogue was more important than producing another set of maps that would wind up back in the storeroom. They recognized that this exercise engaged people to think about "process change" and "technology change" as part of the same "change," which was something that hadn't happened until then.

One Team:

The work of web publishing combines creative and routine sub-processes. On the creative side, photographers and graphic designers work with marketing specialists to develop compelling images, and authors develop captivating content. On the routine side, operations specialists perform dozens of tasks to organize images and content so they can be quickly and easily made visible, and then the products they portray can be quickly and easily purchased.

In the previous organization design, the formal process had creative and operations staff producing output that their managers brought into cross-functional meetings where decisions were made about what and how to publish. As managers learned the capabilities of the new omnichannel” software – which enabled people with limited web-design skills to publish images and content - they began asking, “why do we need these meetings? Can’t our people publish without this lengthy decision process? Couldn’t we decide on a set of guidelines they could use to maintain our standards?” And, competitive pressure was increasing rapidly, as product life-cycles shifted from 3-month to 1-month on the average.

These dynamics prompted the leadership team to launch the One Team initiative, to bring marketing and operations together to design and implement a collaborative, horizontal publishing process with much shorter cycle times while maintaining or increasing quality levels and, ideally, at lower cost. When I began this engagement, One Team designers were already starting to talk about organizing their work into cross-functional Campaign Teams. The formation of the Omnichannel Leadership Working Group (see below)

[I have a call with a client on August 11 that will update the One Team organizational design]

The Omnichannel Leadership Working Group:

During the same time frame as the mapping exercise, I interviewed 20 managers and employees, from marketing, operations, and IT departments. The interviews were 1:1, 30-60 minutes long, with 15 questions covering leadership alignment, organization and work design, business readiness, communications, and project team issues. By asking interviewees about previous projects and their experiences so far on the omnichannel project, we distilled their views on what they liked or didn’t like about the project, and what encouraged or concerned them.

There was a lot of agreement among the 20 interviewees about two issues. First, everyone except the IT project managers felt they didn’t understand weekly decisions about what would remain in scope for Phase 1 and what features would be “descoped.” (Recall that an agile development methodology was being utilized, which meant that iterative decisions could be made about which features to implement.) This was very important to manager and employees in marketing and communications, because they needed to know what system capabilities would be in place at Phase 1 go-live to enable collaboration and semi-autonomous web publishing.

Second, all four Directors from Marketing and Operations conveyed the viewpoint that “IT is in charge of the design.” Yet, when I interviewed their IT peer on the project (to whom the IT project manager reported), it seemed that he wanted to collaborate with the business managers, not tell them what to do. And when I interviewed their bosses on the leadership team as well as the people reporting to these Directors it became clear that all were looking to them to drive the project, and that if they collaborated with the IT Director, working together as a team they had all the capability needed to make key decisions needed on both the Omnichannel technology requirements and also the One Team process design. The only thing missing was their recognition that this was in fact this responsibility was theirs to take and was within their grasp.

(As I learned more about the organization, it became clear that previous IT and business directors had “not gotten along,” which had fostered a sense of distrust).

So, there were only two simple recommendations coming from the interviews. First, that the two Creative and two Operations Directors join with the IT Director to form an “Omnichannel Leadership Working Group.” This would empower them to make decisions as a team, and made their collaboration visible to everyone else in the organization. It also enabled consistent communications across their teams, and simplified decision-making for the executives to whom they reported. And, over the longer term, it continued the progress that had been made to get IT and business departments collaborating effectively. The recommendation was that chartering this group should be low-key and not bureaucratic. Following this, the group just started working as a team with no announcement or fanfare whatsoever. And they were recognized to be the leaders who were collectively and visibly accountable for scope decisions.

The second recommendation was to communicate the evolving development plan to marketing and operations staff; not only “what” and “when” but also “why” features would or would not be implemented, and explaining the timing as well. The people I had interviewed had been quite frustrated that they were not “in the loop” to know when specific features would be implemented. All they were hearing were rumors about scope changes that created a lot of tension, suspicion, and uncertainty. Yet it turned out that alleviating this uncertainty would not be difficult. It just required the project leaders to change their communications philosophy from “only communicate what people need to know when they need to know it,” to “build understanding and commitment to use new technology over a time span that recognizes what people go through during the change process.” A “Project Roadmap” was posted on the internal corporate website, and was updated on a weekly basis, supplemented by Department meetings led by the five Working Group Directors, to answer questions and address concerns, reinforcing their collective responsibility for scope decisions.

How can we Interpret what Happened?

Let’s take a second look at the characteristics of Complex Adaptive Systems and briefly suggest how they apply in this case: [See next page]:

| Complex Adaptive Systems | Relevance to this Case |
|---|---|
| <u>Non-Linear Change</u> : Large changes in input may lead to small changes in outcome and small changes of input may lead to large changes in outcome. | Two minimalist interventions significantly improved the project, leading to better and more timely decisions plus alleviating widespread uncertainty. |
| <u>Iterative “Agile” Changes</u> : A series of incremental evolutionary changes. Learning from each change impacts following changes. “Current State” assessment may not have any value. | The One Team design evolved over a two-year period, marked by a few events that pushed participants to learn and act in a more accelerated way. (I.e. the mapping exercise and formation of the Leadership Working Group.) The previous “Current State Assessment” had gone nowhere. |
| <u>Self-Organizing</u> : Constant re-organizing to fit the current environment, induced not by a single entity but rather by the simultaneous and parallel actions of agents within the system. | The Leadership Working Group (LWG) had essentially already formed. All I did was tell them they were in fact already the group they needed to be, and they could start acting that way. |
| <u>Primacy of Relationships</u> : The ways people relate to each other is critical to the way the system functions. The focus of CAS is on relationships versus design causality. | The LWG was effective because of the collaboration skills and intentions held by all the participants. The previous IT Director and one of the prior Operations leaders prevented the LWG from being realized. |
| <u>Co-evolution</u> : Any change in any agent may cause change in the environment. “A butterfly flapping wings in Lima, Peru influences weather in Peru, Indiana.” E.g. disruptive organizations like Uber. | The same point applies. The turnover in IT and Operations was all that it took to enable the LWG to form. |
| <u>Simple Rules</u> : Complex adaptive systems are not complicated with respect to rules. They are characterized by flexibility and varieties of options. | The culture of the client organization enabled leaders to enable the flexible One Team design process, rather than hold tight to a rigid methodology. |
| <u>Edge of Chaos</u> : Systems in equilibrium are dying. Systems in chaos cease to function as a system. The most productive state of any system is on the edge of chaos. | With five simultaneous major software implementations at the same time three new stores were being opened and a busy shopping season approaching plus other process improvement projects also underway and the use of agile development methodology...this environment felt to me like “the edge of chaos.” It continues to be a business leader in its competitive niche and has very low employee turnover. |

Implications for Design Principles

I was asked by conference organizers to address this. However, given the “simple rules” facet of Complex Adaptive Systems, I am reluctant to propose any more design principles, other than one: “try viewing the organization(s) you’re dealing with as Complex Adaptive System(s) and act accordingly.”

Discussion Questions:

1. How have you used CAS principles in your work?
2. What is your experience of the “IT-Business Chasm?” Do you think it still exists? If yes, how are CAS principles helpful in dealing with it?
3. Can we and should we do more to foster understanding of the CAS systems framework?