The Behavior Chain for Online Participation: How Successful Web Services Structure Persuasion

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Abstract. The success of many online services today depends on the company's ability to persuade users to take specific actions, such as registering or inviting friends. We examined over 50 popular Web services of this kind to understand the influence processes and strategies used. We found that successful online services share a pattern of target behaviors that can be viewed as part of an overall framework. We call this framework the "Behavior Chain for Online Participation." This paper briefly presents the general idea of a *behavior chain* and applies it to understanding persuasion patterns found online. We then illustrate the Behavior Chain for Online Participation by applying it to the Web service LinkedIn and other popular services. Future research may identify behavior chains in other domains and develop new research methods for validating behavior chains.

Keywords: Persuasive technology, participatory media, online communities, behavior change, captology, influence, persuasion, World Wide Web.

1 Introduction

Whether working as a social actor, a tool, or a medium, interactive technologies can change people's attitudes and behaviors using influence strategies established by the social sciences [9, 10]. Persuasive technology is ubiquitous on the Web, and many Web services are successful in bringing about behavior change. This paper examines a pattern of behavior change found across many successful Web services.

1.1 Successful Patterns on the Web

Current Web services exhibit considerable variety in how they structure user involvement; however, patterns can be identified among many successful Web services [6]. This is to be expected for two reasons. First, many Web services have similar behavioral goals for their users (e.g. registration for the service, getting others to join). Second, services that develop good tactics for achieving those behavioral goals succeed while others fail and many new Web services are then patterned after services that are succeeding.

Previous academic work and industry practice has identified some small-scale patterns as best practices in the real world and online (e.g., five star ratings) for

Y. de Kort et al. (Eds.): PERSUASIVE 2007, LNCS 4744, pp. 199–209, 2007.

achieving particular behavioral goals [12, 21]. This paper aims to identify patterns in the sequence of target behaviors of Web services and the means by which those goals are achieved.

1.2 Behavior Chains

Influence strategies can examined individually, but the rich reality of persuasion is sequential: multiple strategies are often used in succession, with each strategy helping the persuader meet intermediate behavioral and attitudinal goals from which new strategies can be applied [8, 11, 5, 22, 23].[1] We call such a pattern of behavioral goals a *behavior chain*. A behavior chain can be represented in a flow chart that consists of *Phases* each made up of one or more goals we call *Target Behaviors*. In the course of this paper we aim to establish one behavior chain as a common and successful pattern on the Web – and as a framework for researching and designing for persuasion in many Web services.

To be sure, the sequencing of target behaviors is not new. Our investigations into the pattern of online behaviors helped us see similar patterns in the offline world, which included persuasive domains such as sales, religious conversion, and dating. In these and other situations, the target behaviors happen in sequence or in sequential clusters. Our paper will focus exclusively on the patterns of persuasion in the online world.

1.3 Participatory Media and User-Created Content

In an increasing number of popular Web services, key behavioral goals for the service depend on users creating content, inviting others to use the service, and otherwise directly contributing to the value of the service. All users are not expected to contribute in the same way, but users are exposed to a variety of influence strategies that lead them to create value for themselves and others, including the act of paying attention to the user-generated content.

Influencing users to create and contribute compelling content and evangelize the service to their contacts are challenging behavioral goals. These goals differ from other long-established purposes for commercial web services (e.g. getting users to make a purchase or spend time consuming traditionally produced content). In many cases, achieving these new goals with some initial users can provide valuable means for achieving the latter with subsequent users. For example, user-contributed reviews on Amazon can encourage satisfying purchases by others [20]. Likewise, attention data and ratings allow YouTube to give top billing to the video content users are likely to consume and then, in turn, refer to their friends [25].

Many online experiences today give users a substantial role in content-creation, user-recruitment, and community building. However, no framework has yet been proposed to show the temporal, contingent, and persuasive aspects of these target behaviors online. Describing one such framework is the goal of this paper.

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[1] "Sequential requests" have been widely studied, but this most work focuses on a small number of short sequences. The most widely known and studied of these are the Foot-in-the-Door and Door-in-the-Face strategies [5]. For applications to persuasive technology, see [13, 14].

2 The Behavior Chain for Online Participation

We identified the behavior chain reported on in this paper through case studies of over 50 Web services. We examined how these services influence users – from motivating them to visit the site to inspiring them to create the very content that makes the service valuable to others [4]. As the patterns of persuasion became apparent, we iteratively developed flowcharts to describe the sequences we recognized repeatedly. We call this pattern the Behavior Chain for Online Participation – henceforth, the Behavior Chain. Figure 1 is a diagram that represents the Behavior Chain.

The Behavior Chain consists of three Phases, each with at least two Target Behaviors. As users move along the Behavior Chain, the Target Behaviors generally become more demanding. User behavior in the final Phase contributes to the service's appeal to new users. The next section explains this framework in more detail through an extended case study and additional examples.

3 Paths Along the Behavior Chain

When people use successful Web services today, they almost always follow a path through the Behavior Chain.

There are multiple paths through the three Phases of the Behavior Chain, some of which are more common than others. To illustrate how a service influences users to move along the Behavior Chain, this section of our paper primarily considers a single service, LinkedIn, through the lens of the Behavior Chain. Along the way we identify other Web services that use similar techniques to achieve the same Target Behaviors and highlight alternative methods applied to each part of the Behavior Chain.

LinkedIn. LinkedIn is a Web service for professionals seeking to sustain, leverage, and expand their professional networks for career advancement, filling open employment positions or contracts, gaining knowledge from domain experts, and maintaining professional relationships [19]. It fits into the social network genre of Web services. Each LinkedIn user creates a profile detailing educational and professional background and interest in being contacted. Each user also designates other existing users as their connections or invites non-users to fulfill this role.

3.1 Phase 1 – Discovery

In the first Phase of the Behavior Chain, users become aware of the Web service; this is the *Discovery* Phase. This Phase includes two Target Behaviors – that potential users learn about the service in a way that supports further Target Behaviors on the chain and that potential users visit the Web site. In Phase 1 the most common order is that users first *Learn about service* and then *Visit the site*. However, the reverse is also prevalent. After describing each Target Behavior in Phase 1, we give examples of both orders.

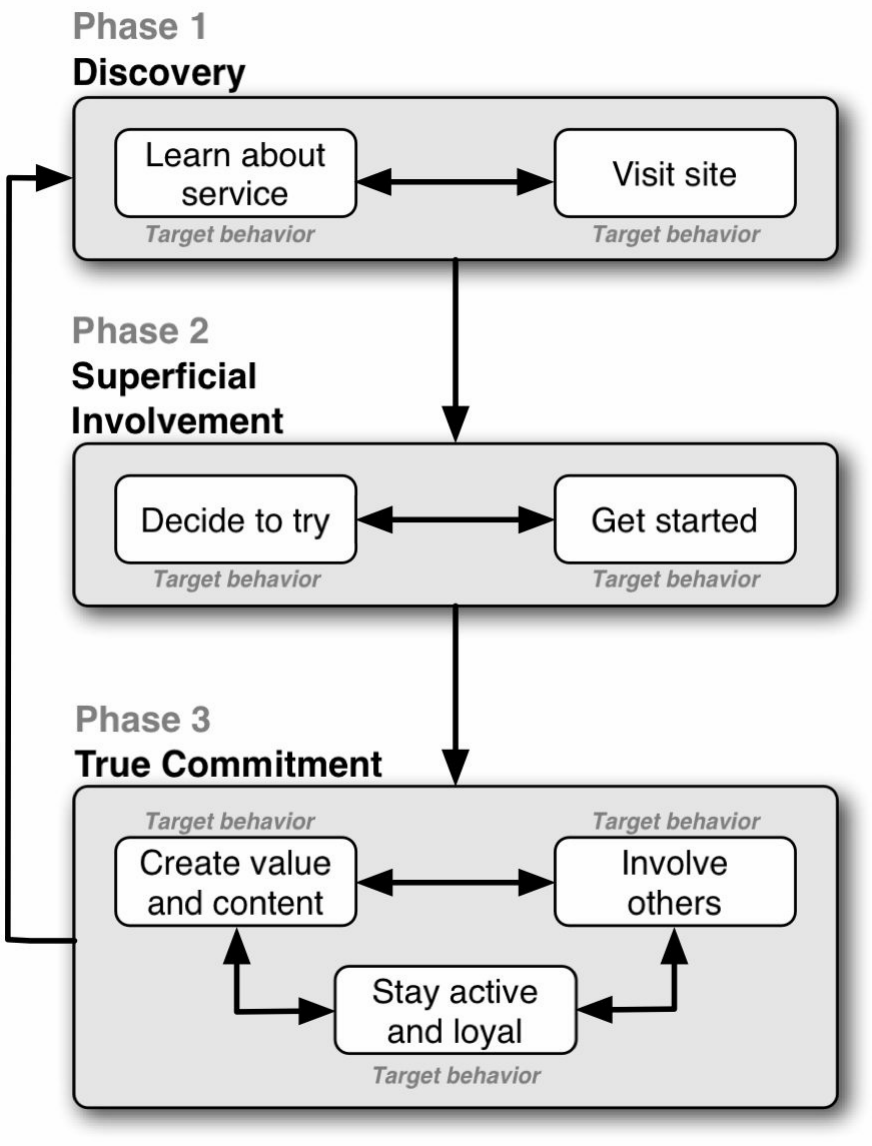

Fig. 1. The Behavior Chain for Online Participation. The Behavior Chain is found across many successful Web services. It consists of three Phases, each with multiple Target Behaviors. When users reach the *True Commitment* Target Behaviors – specifically *Create value and content* and *Involve others* – they contribute to the service's ability to influence new users to follow the behavior chain. (We acknowledge help from Mike Krieger and Jyotika Prasad in creating the early versions of this diagram).

Learn About Service. Most Web site operators seek ways to motivate people to learn about their service. Users can learn about a service from many sources – e.g. email from friends, word-of-mouth, in traditional media, or embedded on another Web site. How and what users hear about a service is key to their decision to move further down the Behavior Chain. For example, a trusted friend's email saying, "This site is a cool!" will likely offer more motivation than an unknown blogger linking to a Web site. Strategies for creating awareness about Web services introduce a close connection with the Phase 3, because established users and their creations can attract others to join them in using a Web service, leading to the looping back or "viral" element that Web site operators seek.

Visit Site. In most cases, Web site operators use a variety of methods to motivate people to visit their site. Many are directly tied to how users hear about the service. For example, a user who has posted pictures of a new baby on a Web site can likely motivate relatives to visit the site for the first time. In other examples, a social filtering service, such as Digg.com, can influence people to go to a site for the first time, based the credibility of the community's aggregated recommendation. A user's first visit to a site creates opportunities to educate and influence, preparing the path for moving new users further down the Behavior Chain.

Flickr.com serves as a helpful example of the persuasion dynamics in Phase 1. When a user of the photo-sharing Web service Flickr invites a friend to use the service, Flickr leverages the inviting user's credibility to educate the recipient about Flickr and influence them to visit. The invitation arrives as an email with the friend's name, not 'Flickr', as the sender. The Flickr system helps people perform Target Behavior *Learn about service* even before visiting the site. Specifically, the default email message to new people includes information about Flickr; furthermore, part of the message is not editable by the sender, but no distinction is made between these sections for the recipient. Informed about Flickr and that it "takes less than a minute" to sign up, the recipient can be motivated to *Visit site*, a key Target Behavior in Phase 1.

The Target Behaviors can happen in reverse sequence in Phase 1. For the other order – *Learn about service* after *Visit site* – let us turn to LinkedIn. As in the Flickr example, the start of Phase 1 for a potential user relies on value created from existing users who are in Phase 3 of the Behavior Chain.

LinkedIn creates a basic public profile for all users and optimizes the profiles for search engines. The public profile shows only the user's name and industry, but it also includes links to join LinkedIn and establish the existing user as a connection.

Potential users who search the Web for the name of someone, such as a business colleague, may get search results that point them to a LinkedIn profile for that person. As a result, without any previous knowledge of LinkedIn, a potential user can go to a LinkedIn page. Note that the Target Behavior *Visit site* comes before *Learn about service*. In this case, the Phase 1 sequence of LinkedIn is the reverse of Flickr.

Yet Linkedin functions much like Flickr in motivating users to go from Phase 1 to Phase 2. In both cases, the site functionality is limited until users get involved with the service. In the LinkedIn example, the potential user sees a colleague's basic profile online, which creates a positive association with the service. However, the potential user cannot see the colleague's full profile until after registration. Knowing

that additional information about a colleague is available can be a compelling incentive to take action. As a result, with the positive association and motivation in place, the potential user is likely to transition from Phase 1 *Discovery* to Phase 2 *Superficial Involvement*.

3.2 Phase 2 – Superficial Involvement

In Phase 2 of the Behavior Chain, Web services influence users to *Decide to try* and to *Get started* with the service (e.g. by creating an account, starting to consume content). Both of these Target Behaviors are aspects of *Superficial Involvement*.

A unifying feature of the Target Behaviors in Phase 2 is that they consist of one-time actions. In other words, compliance is the goal in Phase 2 rather than seeking a long-term behavior change. Despite the short-term nature of these Target Behaviors, the methods used to influence users has implications for Phase 3, where long-term behavior change is the goal. For example, if a Web service gains compliance in Phase 2 in ways that damage trust, then the user may be less likely to Transition to Phase 3. Successful Web services must gain compliance in Phase 2 while preparing the path for *True Commitment* in Phase 3.

Decide to Try. One Target Behavior in *Superficial Involvement* is *Decide to try*. This means that users decide that they will use this service to meet some needs or fulfill some desires of theirs. In some cases, drawn by such things as new baby photos, users may not recognize they are preparing mentally to invest themselves in a new online experience. Indeed, the psychological mechanism behind *Decide to try* is a worthy area for future experimental research.

Get Started. Another Target Behavior in this Phase is *Get started*. For many Web services, this includes signing up for the service by creating a free account. Registration is often necessary to make possible subsequent behaviors, such as creating content tied to an identity. Furthermore, registration opens new channels of communication (e.g. email updates) and makes new persuasive techniques possible (e.g. tailoring over months of use). But there is often a trade-off here: a very short account creation process can make it more likely users will sign up, because less effort is required from users. However, gathering additional user information early in the Behavior Chain may benefit the Web service more. How to best balance these competing needs – making registration simple versus gathering user information early – is a rich area for future research.

LinkedIn uses at least three techniques to influence users to get started. On its home page, LinkedIn highlights the ease of joining by stating: "Create your profile and make 5 connections in 5 minutes." Perhaps more interesting is how they use their existing users to influence new visitors to the home page. LinkedIn emphasizes that "People you know are already LinkedIn" and encourages users to find (by name) someone they know who is a member. After a user chooses to get started, LinkedIn opts to gather more information than many sites, but once the process is complete, users already have connections with other users.

Again, there is no single order for the Target Behaviors in Phase 2. Different services – and even the same service – structure these steps in various ways. Sometimes users may decide to try the service only after getting started (e.g. registering on the site). Sometimes sites encourage users to get started with the service before having to make a commitment to it. This latter option is most common with Web service that focus largely on consumption; that is, many successful Web services allow people to view content on the site without registering first (e.g. YouTube, Flickr, eBay, MySpace). Other types of sites also allow people to use the service before registering: uploading photos to share (as on Bubbleshare), editing a page (as on Wikipedia), or personalizing the service (as on Google Personalized Home Page). This approach can delay user decision-making about whether to seriously commit to using the service until after users have more first-hand experience. This in turn leads to Phase 3 – *True Commitment*.

3.3 Phase 3 – True Commitment

In the previous Phase, users become involved in the service but generally without making a large or permanent investment in using the site. Deeper investment comes in the *True Commitment* Phase (c.f. [24]): users contribute value, involve others in the service, and continue to be active and loyal users. These three Target Behaviors are often closely linked, as a single user action can create value, involve others, and ensure a return visit soon.

Unlike in previous phases, the Target Behaviors of *True Commitment* go beyond one-time compliance; that is, this phase is characterized by longer-term Target Behaviors that involve creating habits in users. For example, a user commenting on a video just once, while potentially valuable, is not the primary goal in Phase 3. Instead, in this Phase, Web services aim at creating habits, e.g., persuading users to frequently comment in response to videos. Influence strategies that achieve compliance at the cost of credibility (e.g. the Door-in-the-Face strategy) are more likely to fail in Phase 3 [c.f. 3].

The Target Behaviors of Phase 3 contribute to a service's success in introducing and moving other users through the chain. For this reason, Figure 1 includes a path from Phase 3 to Phase 1.

Create Value and Content. User behavior can make the service more valuable to others. This happens when users explicitly create valuable content that others will consume (e.g. a video or a book review). But users can also incidentally contribute to the automated construction of others' experiences with the service (e.g., with attention and purchase data). Some contributions fall between these two points: when, for example, users give rating to videos on Amazon or NetFlix, though they may recognize that others will consume this in some way (e.g., through an average rating or tailored recommendations), their motivation for this behavior may not involve others' experience (e.g., a user may want to improve the system's personal movie recommendations). That is, user motivation to rate content is to help themselves, not others. Of course, the incentives for different contribution will vary [7, 15], even within the same service. Examples follow:

LinkedIn uses several strategies in influencing users to create value for the service – whether it is completing a profile, recommending a contractor, or creating a job posting.

LinkedIn encourages users to complete their personal profiles by tracking their progress on prominently displayed progress bar and noting how much a specific action would increase "profile completeness".

LinkedIn uses reciprocity to motivate recommending a service provider, such as a lawyer, to contacts: along with a list of recommendations from a user's network, LinkedIn notes that “your network has recommended [X] services, but you haven't recommended any. It only takes a minute to return the favor.”

LinkedIn and other services also use quick, positive feedback to encourage content creation. This can be as simple as a thank-you immediately following a submission. But often other users' responses serve as feedback. By promoting the newest content, many services (including Yahoo! Answers, Flickr, YouTube, and LinkedIn) make immediate feedback from others very likely. This technique connects two Target Behaviors in this Phase: *Create value and content* leads to *Involve others*. In other words, the original content creation motivates comments and replies from other users, thereby involving them and providing a reward for the original contribution.

Stay Active and Loyal. Web services benefit when their users repeatedly choose to always use one Web service instead of competing alternatives. Web services often implement strategies to encourage repeated visits to their site.

LinkedIn updates their users by email about changes in their networks (e.g. career updates by friends, an increase in the size of their networks). These emails encourage users to return to LinkedIn, and the emails often recommend taking action in a related way (e.g. updating one's own profile, adding new contacts). Key information is not included in the email; that is, only by clicking on a link in the email and visiting LinkedIn will allow the users to find out the details. To encourage more visits than update emails, a user's LinkedIn home page always includes the most recent updates about their network – a positive reinforcement for frequent visits.

Involve Others. Increasing the number of users, especially committed users, of a Web service is a common goal. Many Web services enlist their current users towards this Target Behavior by persuading them to involve others to use the service. This can happen in one of several ways. For example, on social network sites, users invite others to be their friends. But in other sites or in a different context on the same site, users involve others in a much more content-centric way, such as clicking a link to share a video with a friend.

Because having a number of contacts is a prerequisite for many uses of the service, many social network sites use reduction [9] extensively to encourage establishing and expanding one's network. LinkedIn and several others services support bulk imports from online and desktop email software.

This Target Behavior goes beyond encouraging non-users to sign up. For example, on Facebook, a social network service, many user actions help keep others involved in the service. As part of its encouragement to create a complete profile, LinkedIn

influences users to get recommendations about their past work; users thereby invite non-users to register to recommend them or involve existing users in the service again.

4 Implications for Designers

The Behavior Chain has two key implications for designers of Web services. It can motivate decisions about how to structure target behaviors and which influence strategies to apply to for each target behavior.

Follow Existing Patterns. To create a successful Web service, designers should pay attention to the persuasion patterns identified in this paper. Like established best practices on a smaller scale, the Behavior Chain captures the state-of-the-art on successful Web services. That is, how the framework orders and links the Phases and Target Behaviors is based on patterns among successful Web sites, so in following this pattern one is employing a chain that is most likely to lead to success. Choosing to pursue a different path – breaking new ground – is admirable and might work, but this approach is risky.

Match Goals and Strategies. Some of the behavioral goals in the Behavior Chain are one-time behaviors – compliance is the goal – while others are best served by creating long-term habits. Likewise some influence strategies are more appropriate for gaining compliance than creating habits, and vice versa. By identifying the type of behavior change and the influence strategies suited to that type, designers can make informed choices about which influence strategies to implement.

5 Directions for Future Research

This work in outlining the Behavior Chain also suggests directions for the future study of persuasion and the development of new research methods.

Other Behavior Chains. This paper uses the concept of a behavior chain largely to a single end – understanding how Web services sequence intermediate goals and influence strategies to achieve difficult behavior change. But this concept can be pressed into service elsewhere. Smoking cessation, online commerce, and perhaps even courtship for marriage could be described with behavior chains. Future research could identify successful behavior chains in an array of other domains, including health, gaming, and grassroots political action. These behavior chains can be mapped and compared to each other to understand the structure of persuasion over time at a deeper level.

Research Methods. We developed and validated this behavior chain through numerous case studies, but new, general methods are needed for more rigorous evaluation. The current work leaves many research questions open, and identifying behavior chains elsewhere on the Web may be more difficult. We anticipate the development of new methods for evaluating successful patterns of behavior change online.

Acknowledgments. We would like to thank our students from the 2006 Stanford course on persuasive technology for creating many of the case studies from which the Behavior Chain was developed. We would also like to thank Mike Krieger and Jyotika Prasad for creating early versions of the Behavior Chain diagram.

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