

# The Access Problem

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## Abstract

An important problem for system dynamicists, indeed for researchers in general, is how to gain access to empirical data sources. The issue of access is important to consider in judging the validity of theory created from empirical data. In this paper we review the scarce literature on access and create a System Dynamics model to explore the problem.

**Keywords:** Access, System Dynamics

## Introduction

A practical and very important issue for researchers is how to gain access to empirical data. Sometimes it can be found in public archives or gained through laboratory experiments. However, for researchers working on organizational problems, or social science in general it sooner or later becomes necessary to gather data in the field. A multitude of techniques have been developed. Examples are surveys, interviews, observation and participation. There is an abundance of literature, practical and theoretical on these techniques. However, before the researcher can actually do, e.g., an interview, he or she must gain access to an interview subject. Someone must be willing to grant an interview. The road from the initial research idea to the actual data gathering can be arduous. That process is the focus of this paper.

The theme of access was chosen because of our own experiences from the field of information security management. Information security data is by nature secret and this makes it difficult to gain access. We wished to look at other fields to see if we could learn anything that might improve our own situation.

We first briefly describe the reference mode and the dynamic hypothesis, before we present the quantitative model.

## The Nature of the Problem

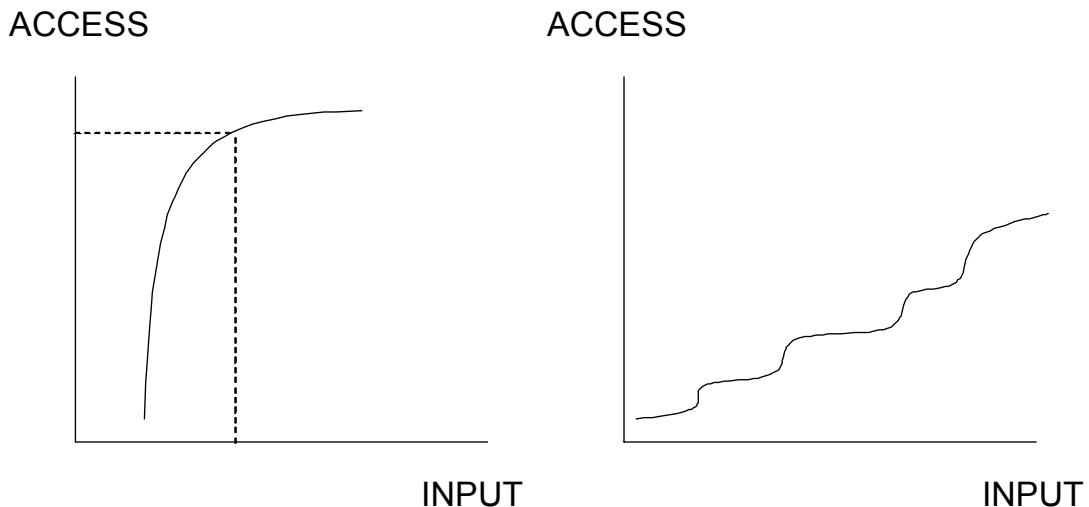
Accounts of how access was gained is normally either ignored in research reports or relegated to appendices (Feldman, Bell, and Berger 2003). This is puzzling since how and the level of access gained is important for judging the validity, or more appropriately, the usefulness of the research results.

There are few comprehensive works on access. We have only managed to locate two books with case studies on gaining access, and one book treating access in a major chapter (Brown, Monthoux, and McCullough 1976; Feldman, Bell, and Berger 2003; Gummesson 2000). The Access Casebook from 1976 provides 30 different cases from which readers can make their own judgment. A more recent book from 2003, called Gaining Access, provides a number of anecdotes and attempts to develop a theory of access. They see access as relational. Gaining access is primarily a matter of building and maintaining relations between people. Furthermore, they divide access into three stages: Making Initial Contact, Developing Rapport and Ending the Relationship. The third stage will not be treated in this paper. The third stage is important in facilitating future re-access, but in this paper we wish to focus primarily on gaining access to individuals or organizations for the first time, since this is one of the primary challenges in information security research, and one that we have ourselves faced many times.

Gummesson, in his book Qualitative Methods, writes about the different roles that researchers and consultants adopt to gain access to organizations. He divides the roles into: Analyst, project participant, catalyst/therapist, OD consultant/interventionist/clinician, change-agent, external board director and management for hire. His hypothesis is that the quality of access is highly dependent on the role the researcher or consultant adopts. An analyst, for example, does most of his job at his own desk, emphasizing a written report as the final product. Whereas for a change agent, the written report is relatively unimportant compared to lasting changes in the organization.

A usual first step in creating a System Dynamics simulation model is to develop a reference mode. This usually takes the form of graphs of behaviour over time, as well as supporting information. In the case of access there are no statistics that can be used as reference modes. Hence, we must rely on qualitative descriptions of events as recounted in Gummesson, Feldmann et al. and Brown et al (op. cit.).

Gummesson uses his experience to sketch access development over time. He writes that if access was purely a matter of distributing questionnaires and doing limited personal interviews, access would be pareto optimal. That is, it would follow the 20/80 rule. 80% of information would be obtained by a 20% input of effort, while the remaining 20% of information would require huge resources. However, he contends that access develops by leaps as a function of the time involved and the sophistication of the research methods.



**Figure 1. Pareto optimal access and access in leaps.** Adopted from Gummesson.

He likens access to an iceberg where only 10-15% is visible above the surface and can be easily viewed, for example through questionnaires and personal interviews. The rest requires more sophisticated methods to be revealed. Gummesson suggests that participatory observation allows one to delve deeper below the surface, but that action research is the most powerful method. Action research is a very wide term, denoting many different strands of science with a common core (See e.g. Handbook of Action Research (Reason and Bradbury 2001) for examples of the different strands), but all of them require a significant investment of time and heavy client involvement. Indeed, action research as it is commonly understood is not research on clients, but co-research together with the client, i.e., the client is involved as a researcher rather than just as an information source. The deeper involvement that the client has in such a project facilitates the development of trust between researcher and client.

The anecdotes and case studies in Feldman et al. and Brown et al. (1976; 2003) support Gummesson's analysis. Many of the cases describe how informants gradually revealed more information as they came to trust and appreciate the researcher. An example is an American woman who was doing research on minorities in post-war Bosnia. She recounts how it took many months of repeated interaction to build enough trust to gain answers to the questions she had. She had to overcome an atmosphere of intense distrust. "I felt they would discuss personal experiences only after having an opportunity to judge my trustworthiness." Feldman et al. (2003, p. 71)

On the whole, the issue of trust building appears to be central to all the described cases. Informants may have many reasons for not immediately revealing their opinions. This may include e.g. racial issues, suspicion of ulterior motives and perceiving the research as not helpful to them. Although, endorsement of the researcher by the colleagues or friends of the informant may help, the main method of overcoming these barriers is to spend time and effort to build trust. Researchers must show that they are impartial, that they are trustworthy and that their work is valuable. Many times this not only involves work that is directly useful to the researcher, but may for example involve folding newspapers for the informant's son's part time newspaper distribution job (Feldman, Bell, and Berger 2003). This action by the white researcher demonstrated to the black mother a willingness to help and caring for people in her situation that she did not expect from "white folks".

Another recurring theme in the case studies is the gatekeeper. The gatekeeper guards and restricts access to informants. He or she may be a top- or mid-level manager in an enterprise or a social worker in a recovery programme for crack addicts. Convincing a gatekeeper facilitates access to other informants. Larger organizations may have several gatekeepers at different levels. For example, in a prison system the warden of each prison is a gatekeeper. Some times there is no central gatekeeper, but rather each person is his or her own gatekeeper, with no or little influence over other gatekeepers.

Access can be self sustaining. Brown et al. describe a case where the department head of a business school had become so renowned for research and consultant work that business managers wanted to be “done by him” (Brown, Monthoux, and McCullough 1976). However, although clients may come knocking on your door, it is far more usual for a researcher to be the one who knocks on doors. To progress beyond the proverbial foot in the door, the researcher must have a sales pitch to convince the gatekeepers that the project is indeed interesting and that it is useful for them. Feldmann et al. uses the metaphor of “a hook” to describe the sales pitch. The hook can take many forms, it can be written in a letter, it can be an email or it can be spoken over the phone or face to face. Many of the anecdotes in Feldmann et al. tell of how the hook changes as it comes into contact with gatekeepers. Most of the researchers experienced being turned down several times before they finally gained access. Each time they revised the hook to fit better with the terminology and expectations of the target group.

Once the researcher has gained informants and their trust the informants may know other gatekeepers and can help the researcher to gain access with them. This may for example be the case if a researcher is working with a large organization. This kind of process can be dubbed “snowball sampling” (Feldman, Bell, and Berger 2003). The work lies in pushing the snowball over the top of the hill, but once it starts rolling, it keeps on rolling. This suggests that the hardest part of gaining access often is the initial stage. Of course, the importance of doing a good job throughout the whole research process can not be discounted. As suggested by Gummesson, gaining access seems to be a continuous effort.

“For most people, being turned down is a deeply distressing event.” (Feldman, Bell, and Berger 2003) Morale plays a significant role in the process of gaining access. Being turned down over and over again can dishearten even the most persistent researcher. Although, all the researchers that contributed anecdotes in Feldmann et al. ultimately were successful in gaining access, some of them were close to giving up when they had their big break. One had even created a new research proposal based on personal interviews rather than participation and had started interviewing friends and business contacts when she finally gained the access she wanted (Feldman, Bell, and Berger 2003).

### **Dynamic Hypothesis**

We now have enough information to attempt to formulate a dynamic hypothesis:

It seems that the first stage of gaining access is a trial-and-error process. The researcher develops “a hook” that is further developed through direct contact with gatekeepers. When the “hook” has been improved enough the researcher is able to

gain access. Hence, the first stage of access requires a significant investment of time and effort. The researcher is likely to be turned down many times, which can be deeply distressing, and thus there is a risk that the researcher gives up.

When the first stage has been overcome, initial access is gained in a “leap”, i.e. the gatekeeper provides access to more informants. These informants will only reveal the full extent of their information if they trust the researcher, which therefore has to engage in actions that build trust.

As informants come to trust the researcher they may point the researcher in the direction of new gatekeepers and help them gain access with them. Access is therefore a circular process, the first and the second stage may have to be repeated many times depending on the requirements of the study.

## Model Description

### Stage 1: Convincing the Gatekeeper

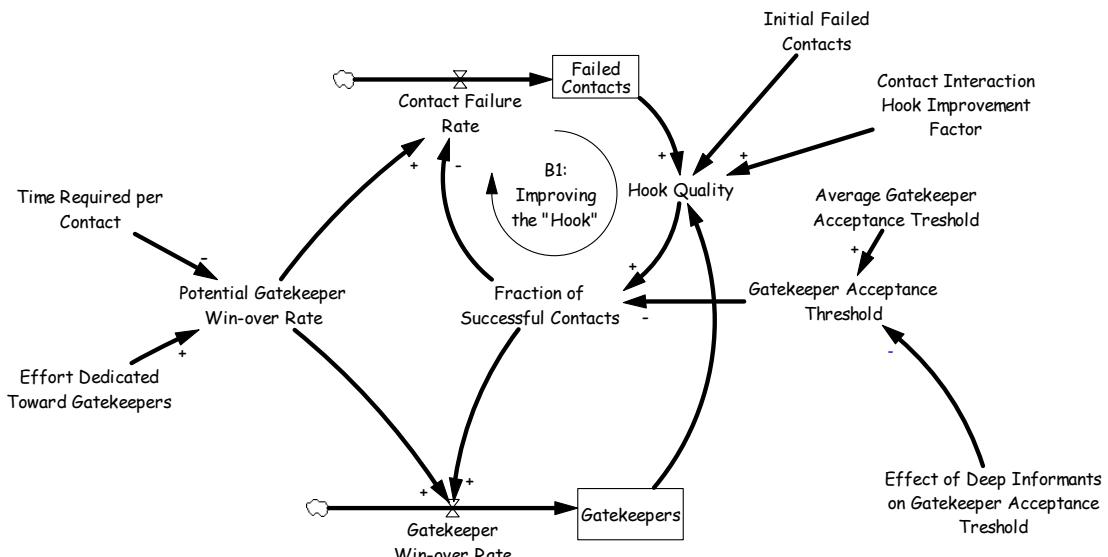


Figure 2. Stage one of the access process.

The researcher must spend time to track down gatekeepers, have other contacts write letters of introduction, make appointments and so on. Hence, only a limited number of gatekeepers can be contacted in a given timeframe. This is represented in the model by *Potential Gatekeeper win-over Rate*:

$$\text{Potential Gatekeeper win-over rate [Contacts/Week]} = \frac{\text{Effort Dedicated Toward Gatekeepers [Hour/Week]}}{\text{Time Required per Contact [Hour/Contacts]}}$$

Once a gatekeeper has been contacted he or she must decide whether to accept it. The gatekeeper has certain criteria, conscious or unconscious, espoused or not, that the request for access is evaluated against. This is represented in the model as *Gatekeeper Acceptance Threshold*. As mentioned earlier, the researcher's sales pitch can be thought of as a “hook”, which has a quality level. The hook is evaluated against the gatekeeper acceptance threshold to determine whether the sales pitch is successful:

Fraction of Successful Contacts [Dimensionless] = IF THEN ELSE(Hook Quality [Dimensionless] >=Gatekeeper Acceptance Threshold [Dimensionless] , 1, 0)

*Fraction of Successful Contacts* combines with *Potential Gatekeeper Win-over Rate* to determine the rates of successful and unsuccessful attempts:

Contact Failure Rate [Contacts/Week] = "Potential Gatekeeper Win-over Rate" [Contacts/Week] \* (1-Fraction of Successful Contacts [Dimensionless])

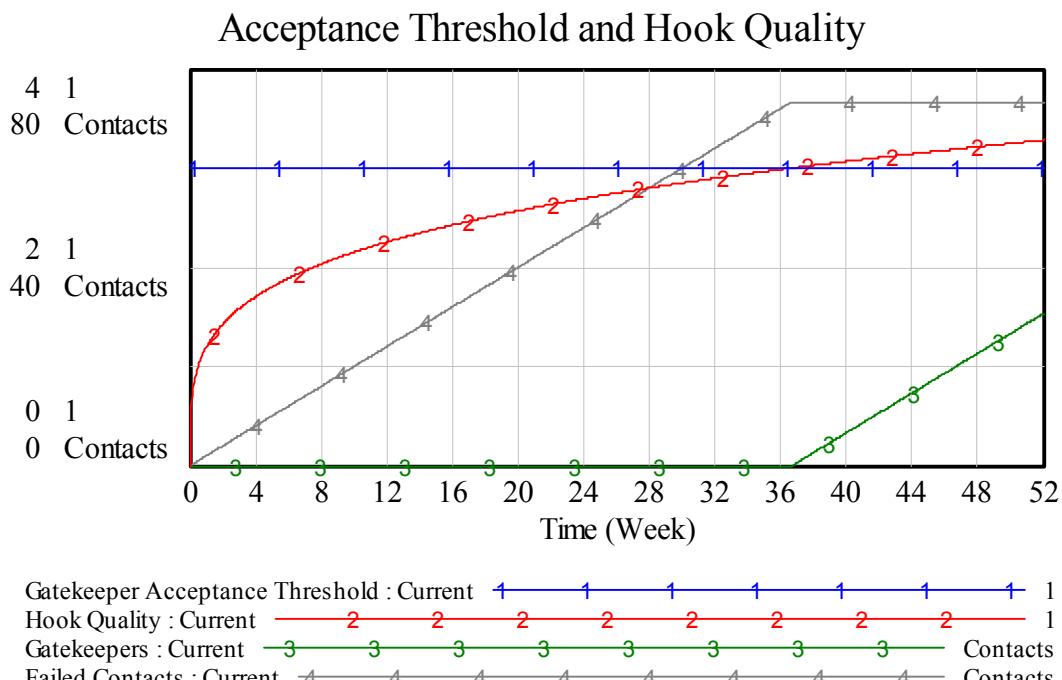
Gatekeeper Win-over Rate [Contacts/Week] = "Potential Gatekeeper Win-over Rate" [Contacts/Week] \*Fraction of Successful Contacts [Dimensionless]

Earlier we stated that the “hook” is improved through a trial and error process as the researcher attempts to convince gatekeepers. Failed and successful attempts contribute to this learning process. Failed attempts show what does not work and successful attempts show what does work. The “hook” quality can be appropriately modelled using a power law learning curve formulation:

Hook Quality [Dimensionless] = ((Failed Contacts [Contacts] + Gatekeepers [Contacts]) / Initial Failed Contacts [Contacts])^-log(1-Contact Interaction Hook Improvement Factor [Dimensionless], 2)

For every doubling of successful and failed contacts *Hook Quality* is improved by a certain percentage determined by the exponent.

### Noisy Thresholds

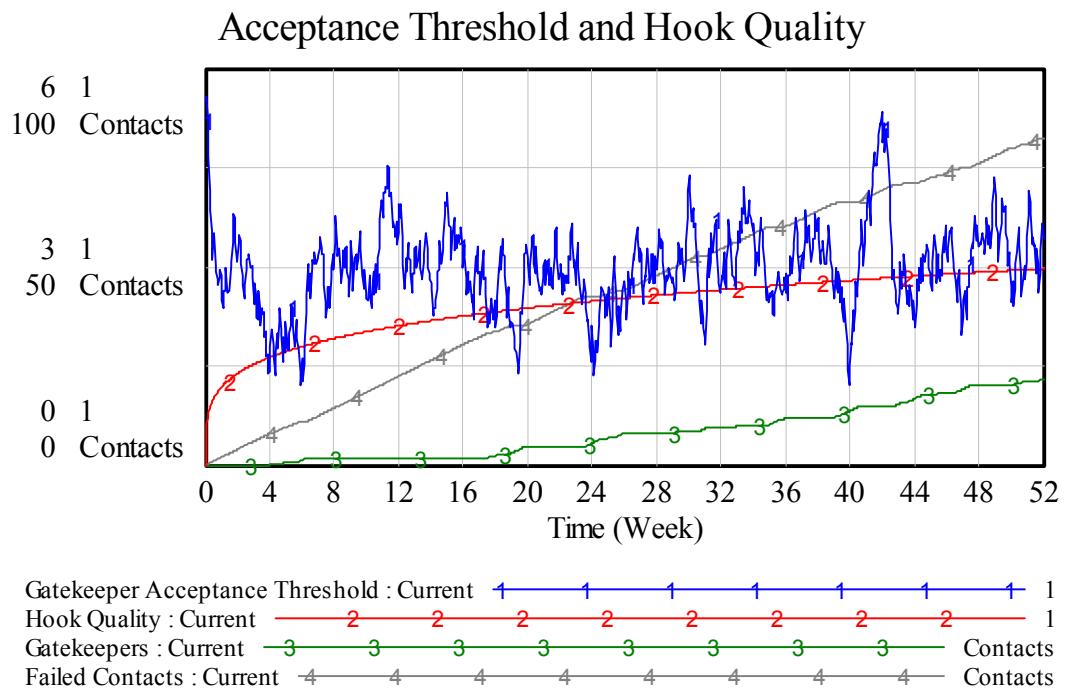


**Figure 3. Simulation of stage 1.**

The Previous figure shows the behaviour of the stage one part of the model. The hook is improved through trial and error until it has the required quality, i.e. it is equal to

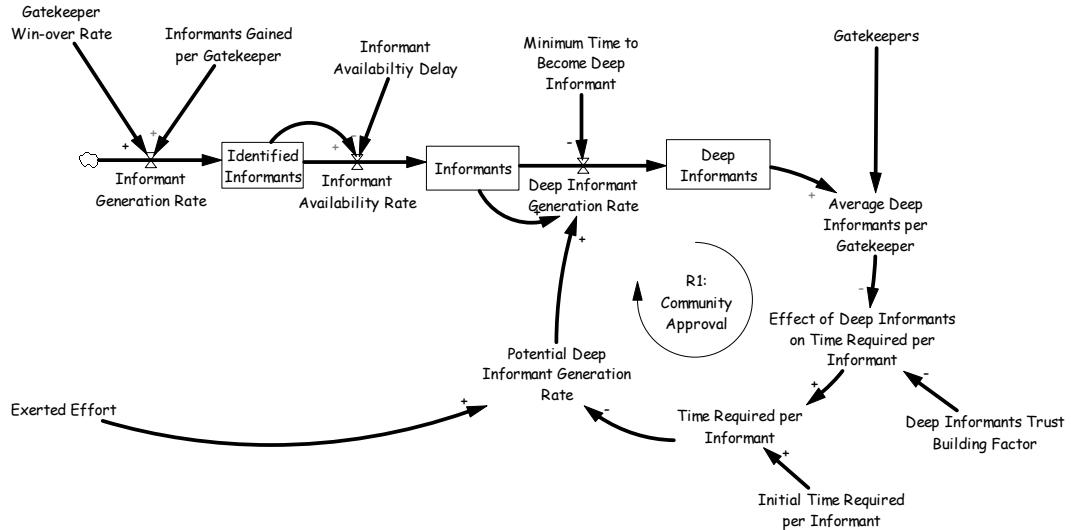
*Gatekeeper Acceptance Threshold.* At that point the researcher starts to obtain access. This behaviour makes sense and is logical. However, it is not quite realistic. In the simulation run *Gatekeeper Acceptance Threshold* is constant, i.e. all the different people that the researcher solicits access from have exactly the same criteria for access and attitude towards researchers. Moreover, this means that once access is obtained for the first time it is always obtained later. This, we think, is not the experience of most researchers. It is more likely that the access threshold varies from organization to organization and from person to person.

In the run shown in Figure 4 noise has been added to simulate the varying openness and attitudes of different people and organizations toward researchers. Since we do not have any statistical data, we can not calculate the statistical properties of the noise. However, it is likely to be auto-correlated. The researcher may for example be contacting people in an industry where the management attitudes are similar. Therefore, we have used a pink noise formulation (See e.g. (Sterman 2000) for how to incorporate noise in System Dynamics models).



**Figure 4. Stage one with noisy Gatekeeper Acceptance Threshold**

## Stage 2: Building Trust



**Figure 5. Stage two of the access process.**

Once the gatekeeper has been convinced, he or she provides access to other informants. These informants do not automatically trust the researcher, but are at least willing to talk. We assume that each gatekeeper gives access to a set number of informants, thus:

$$\text{Informant Generation Rate [Contacts/Week]} = \text{"Gatekeeper Win-over Rate" [Contacts/Week]} * \text{Informants Gained per Gatekeeper [Contacts/Contacts]}$$

Informants do not immediately become available to the researcher. Helping the researcher is only another item on their agenda. Therefore, there is a delay before the researcher can start working with the informants. The rate at which informants become available is given as:

$$\text{Informant Availability Rate [Contacts/Week]} = \text{Identified Informants [Contacts]} / \text{Informant Availability Delay [Week]}$$

When identified informants flow into the informants' box they are available to the researcher. The researcher must now build trust with them. This is represented in the model by transition from *Informants* to *Deep Informants*. When an informant has become a deep informant the researcher has access to all the information the informant can give. The maximum number of informants that can be worked with at the same time depends on the effort the researcher inputs and the time it takes to build trust.

$$\text{Potential Deep Informant Generation Rate [Contacts/Week]} = \text{Exerted Effort [Hour/Week]} / \text{Time Required per Informant [Hour / Contacts]}$$

The actual rate at which informants become deep informants is determined by how many informants are available. We assume that it takes a minimum of a week to become a deep informant. It is unlikely that an informant is able to immediately, in a short time span, devote all the time needed to work with the researcher.

$$\text{Deep Informant Generation Rate [Contacts / Week]} = \text{MIN}(\text{Potential Deep Informant Generation Rate [Contacts/Week]}, \text{Informants [Contacts]} / \text{Minimum Time to Become Deep Informant [Week]})$$

It is unreasonable to assume that informants do not have any contact with each other. The informants may for example be from the same department, the same community of practice or participate in the same drug rehabilitation program. Therefore, once the researcher has built trust with one informant, this spills over into other informants.

$$\text{Time Required per Informant [Hour/Contacts]} = \text{Initial Time Required per Informant [Hour/Contacts]} * \text{Effect of Deep Informants on Time Required per Informant [Dimensionless]}$$

The spill-over effect is determined by the number of gatekeepers and previously convinced informants, i.e. deep informants. We have used a learning curve formulation. The *Deep Informants Trust Building Factor* determines the increase of the effect with each doubling of *Average Deep Informants per Gatekeeper*.

$$\text{Effect of Deep Informants on Time Required Per Informant [Dimensionless]} = (\text{Average Deep Informants per Gatekeeper [Dimensionless]})^{\log(1-\text{Deep Informants Trust Building Factor [Dimensionless]}, 2)}$$

In the following equation, the additional unit added both above and below the divisor is to make sure that the Effect of Deep Informants per Gatekeeper always starts at one and also to avoid division by zero errors during the simulation.

$$\text{Average Deep Informants per Gatekeeper [Dimensionless]} = (\text{Deep Informants [Contacts]} + 1) / (\text{Gatekeepers [Contacts]} + 1)$$

Figure 6 shows the response of stage two to a pulse in the informant generation rate of magnitude ten lasting one week. *Deep Informants* exhibits classical s-shaped behaviour.

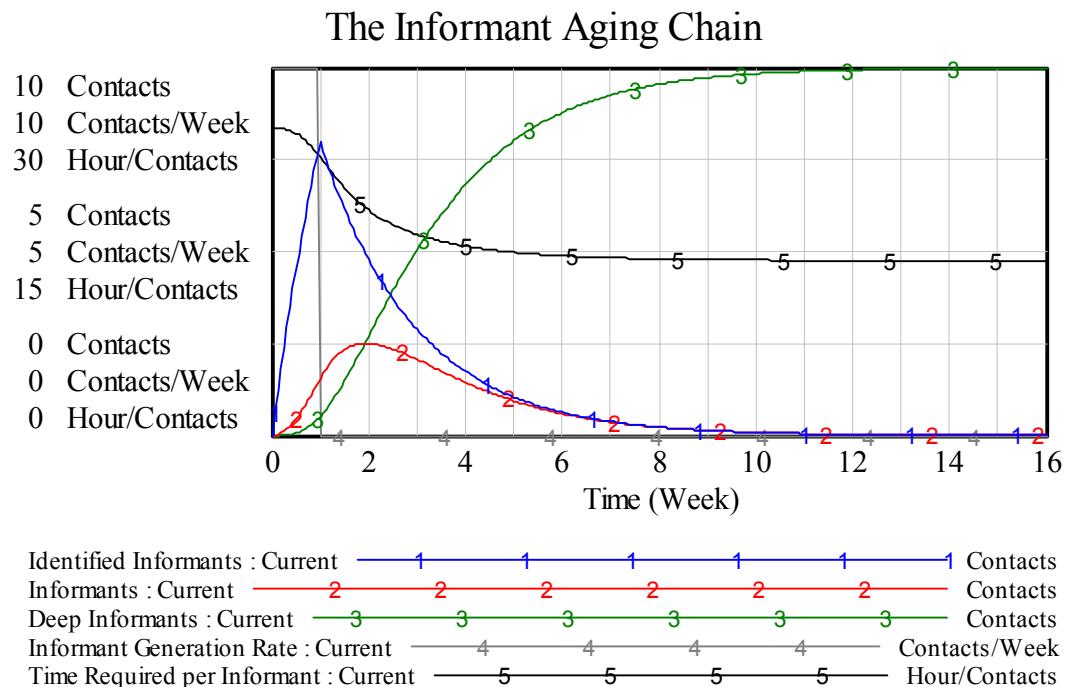
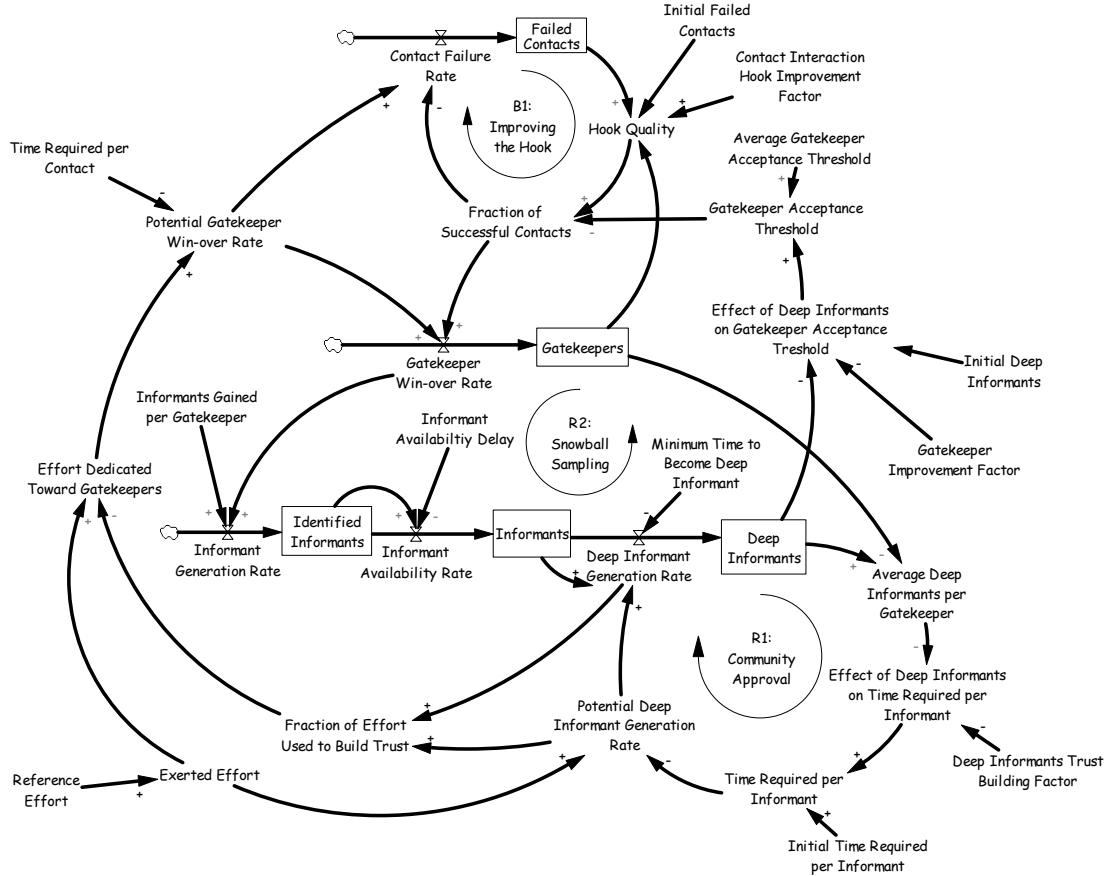


Figure 6. Response of Stage two to a pulse of magnitude ten, lasting one week.

### Combining Stage 1 and 2

Combining stage one and stage two yields the model shown in Figure 7. A new loop now appears, R2: Snowball Sampling. This loop represents the effect of informants using their influence to convince gatekeepers to give the researcher access.



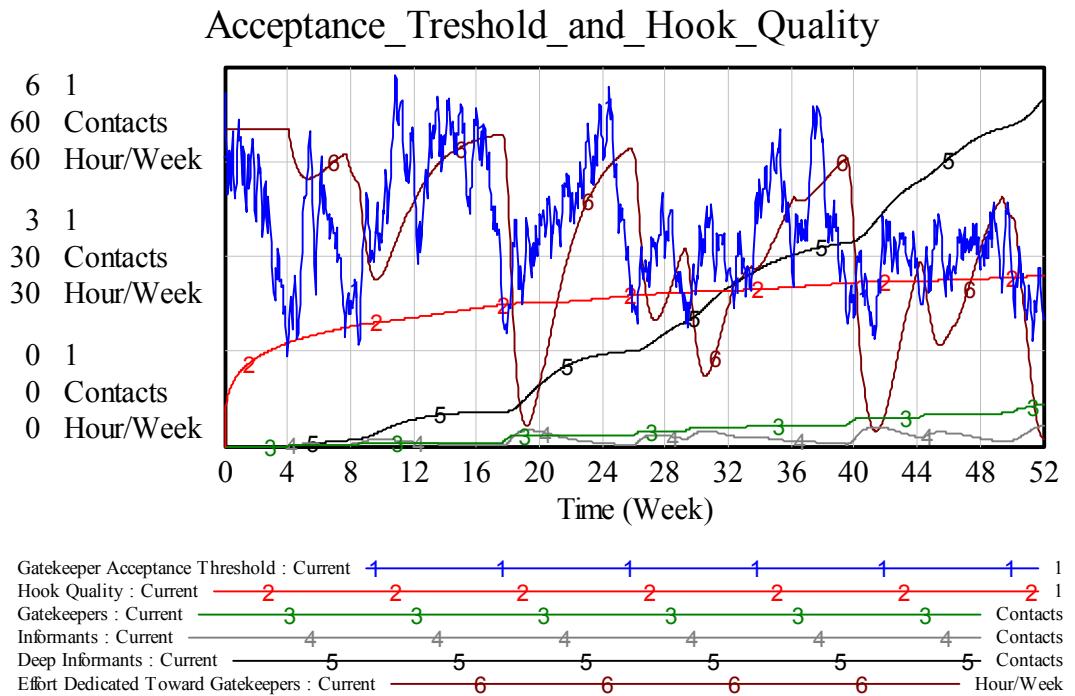
**Figure 7. Stage one and two combined.**

The researcher now has to make a decision as to how much time to spend building trust and gathering data from existing informants, and how much time to use to identify and convince new gatekeepers. We assume that the researcher prefers to spend most of his or her time working with existing informants. When this information source is exhausted, the researcher looks for a new one.

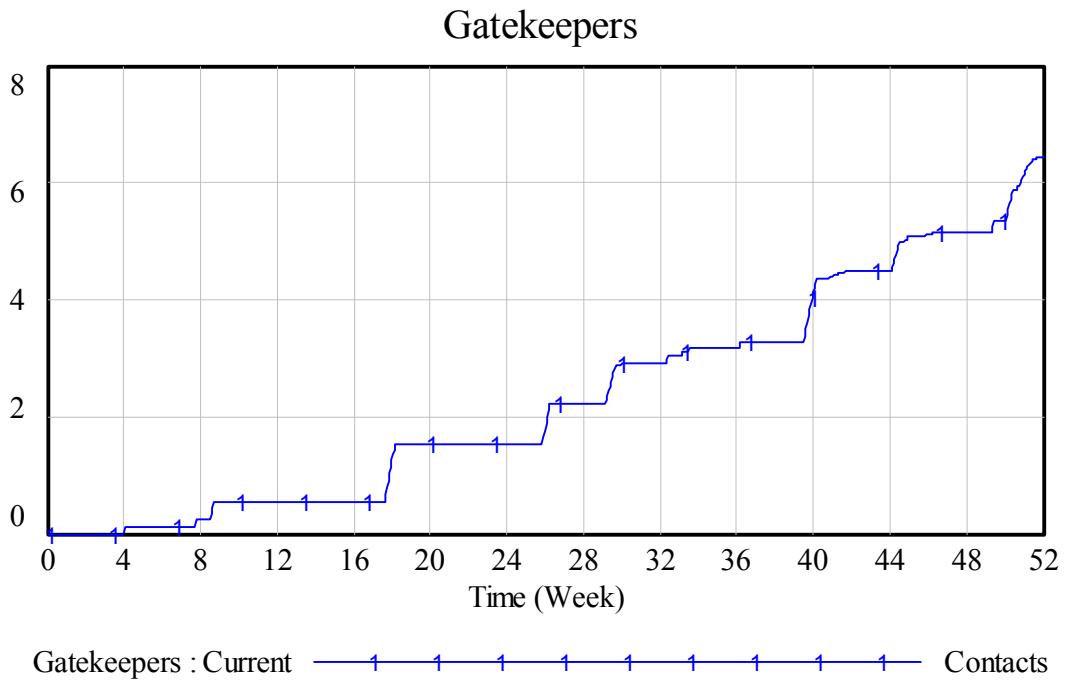
$$\text{Fraction of Effort Used to Build Trust [Dimensionless]} = \text{Deep Informant Generation Rate [Contacts / Week]} / \text{Potential Deep Informant Generation Rate [Contacts/Week]}$$

$$\text{Effort Dedicated Toward Gatekeepers [Hour/Week]} = \text{Exerted Effort [Hour/Week]} * (1 - \text{Fraction of Effort Used to Build Trust [Dimensionless]})$$

Figures 7 and 8 show the behaviour of stage one and two combined. The researcher initially works full time to convince gatekeepers. In week four some minor success with a gatekeeper is achieved and some time is spent with informants. After that a series of smaller and bigger wins is gained with dry periods in between. This behaviour fits well with the behaviour described in the various cases in Gaining Access (Feldman, Bell, and Berger 2003) and The Access-Casebook (Brown, Monthoux, and McCullough 1976).

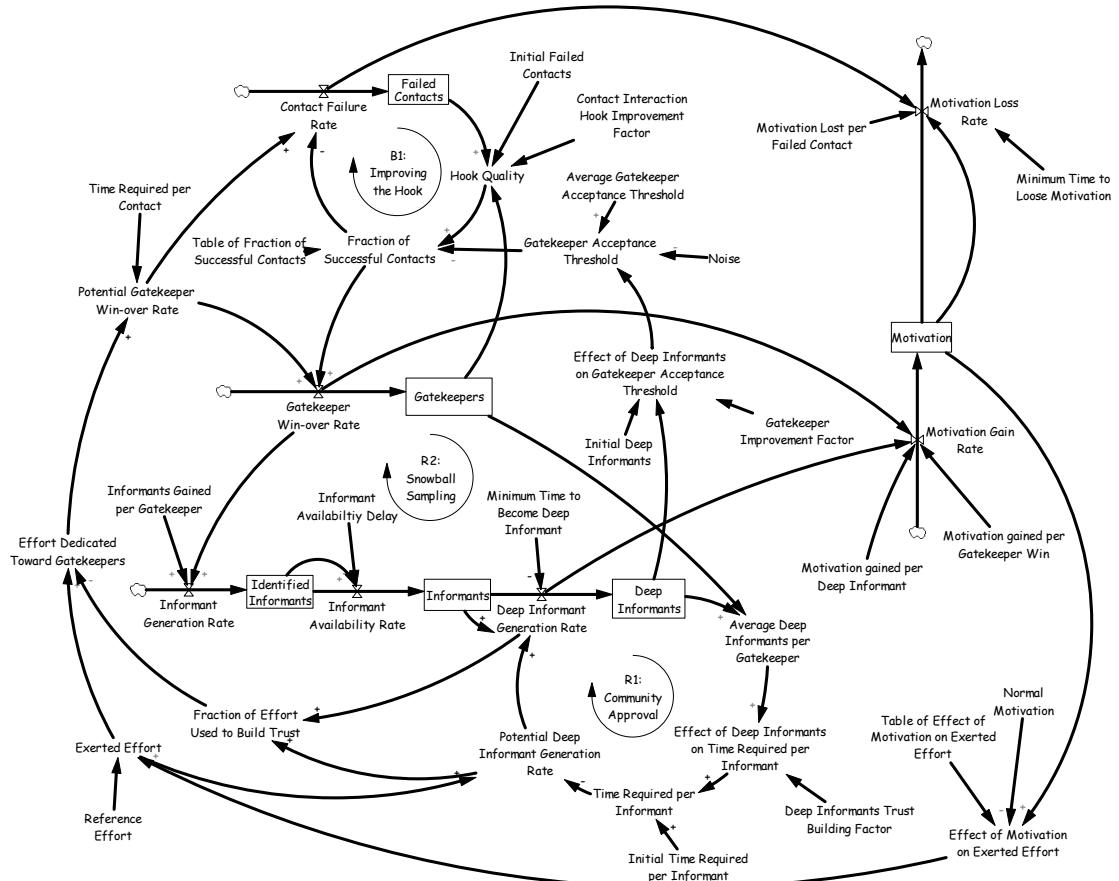


**Figure 8. Behavior of combined stage one and two starting from zero gatekeepers and zero informants.**



**Figure 9. Behaviour of Gatekeepers, stage one and two combined.**

## The Effect of Morale



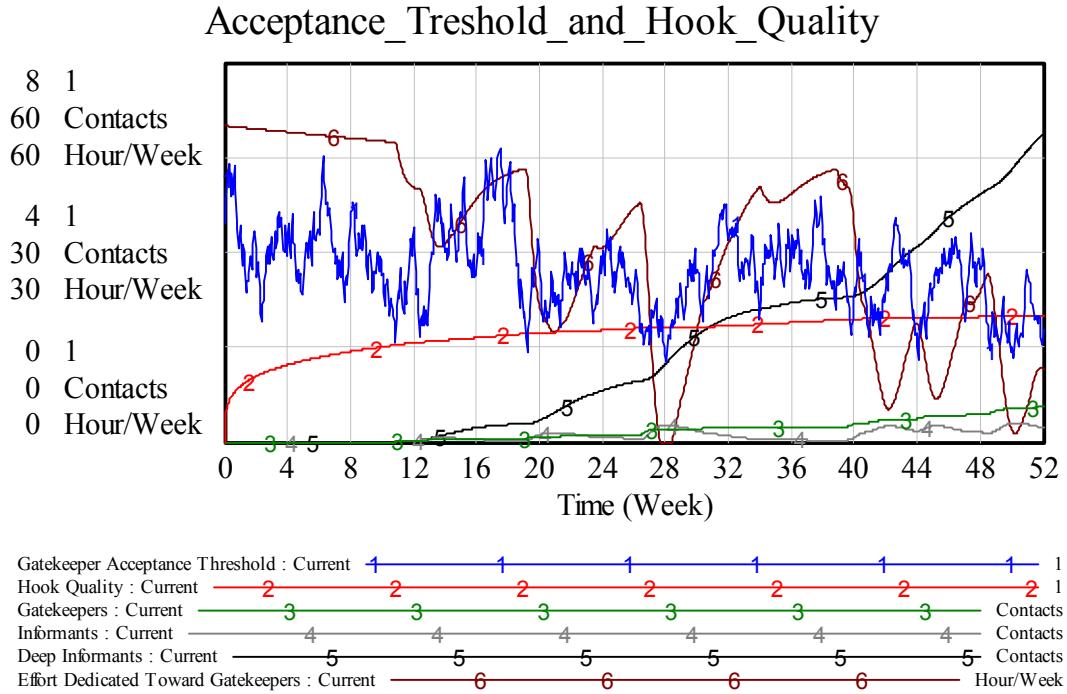
**Figure 10. Complete Model.**

Morale is represented in the model by a level. Whenever the researcher is turned down, morale flows out of the level. When the researcher gains access, morale flows in. Hence the motivation gain and loss rates are given by:

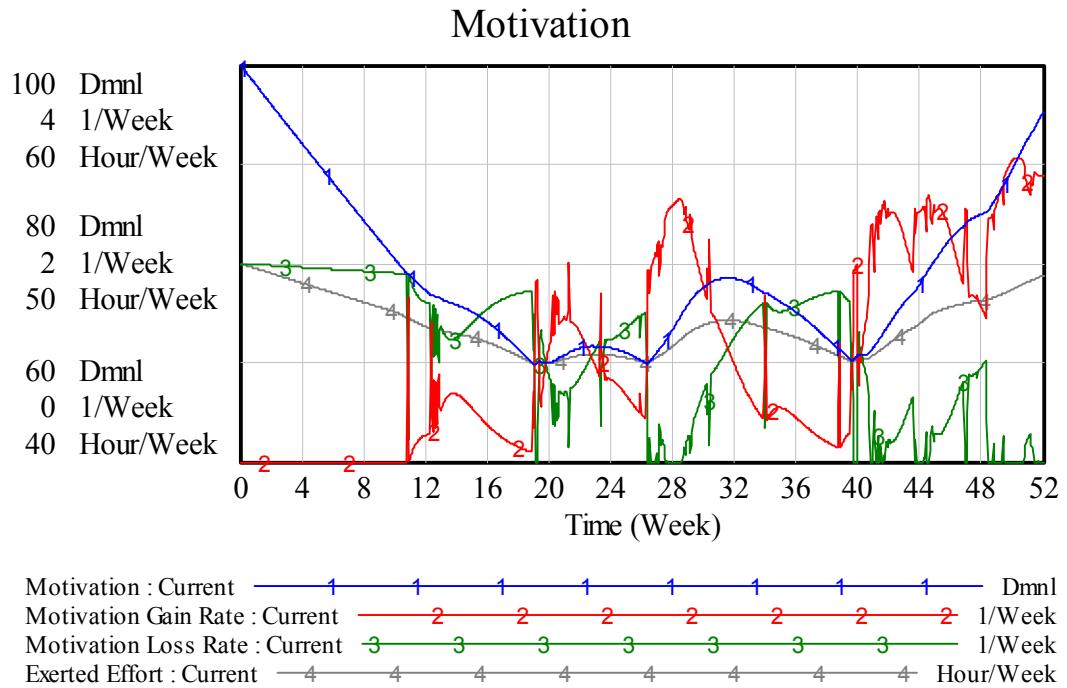
$$\text{Motivation Gain Rate [Dimensionless/Week]} = \text{"Gatekeeper Win-over Rate" [Contacts/Week]} * \text{Motivation gained per Gatekeeper Win [Dimensionless]} + \text{Deep Informant Generation Rate [Contacts/Week]} * \text{Motivation gained per Deep Informant [Dimensionless]}$$

$$\text{Motivation Loss Rate [Dimensionless/Week]} = \text{MIN}(\text{Contact Failure Rate [Contacts/Week]} * \text{Motivation Lost per Failed Contact [Dimensionless]}, \text{Motivation [Dimensionless]}) / \text{Minimum Time to Loose Motivation [Week]}$$

Figures 11 and 12 show the behaviour of the model when morale is added. Morale falls steadily until week 20 when the researcher has a minor success. After that a mix of success and disappointments cause morale to rise and fall consecutively. In week 40 a major success is encountered and morale builds up to almost initial levels. When morale falls, effort dedicated to the research project falls and when morale rises effort rises.



**Figure 11. Behaviour of the full model.**



**Figure 12. Behaviour of morale in the full model.**

## Discussion

We believe that the model reproduces the behaviour described in the cases in Feldman et al. and Brown et al. The model structure recreates a process that is common when researchers attempt to access organizations or individuals for empirical data collection.

What can the model tell us about the access problem? Can we find a more successful strategy for solving it? Getting the first “hit” seems to be the hardest task, to gain

access for the first time. After that has been accomplished, and the researcher has proved himself to the first batch of informants, these informants, in many cases, are able to help the researcher gain access to, e.g., other departments in the same organization, or friends who may be able to give more information. In other words, pushing the snowball over the top of the hill is the hardest part of the process. Not that working to build trust once one has been given access by a gatekeeper is not hard. Depending on the climate one is working in it can be a tough process. But in the majority of the cases described the hardest part was to gain access for the first time. After that the researcher has a chance to prove him or herself and activate the R1 and R2 loops (Figure 10). However, without initial access that is not possible.

Particularly for a researcher who tries to open up a new avenue of research, access is difficult. In this case it is likely that existing contacts are few, that the researcher can not count on previous projects as a way of gaining automatic credibility and that even identifying the right people and organizations may be a problem. Gaining initial access thus becomes a trial and error process with all the challenges that entails. Furthermore, it is greatly influenced by an element of chance. Sometimes one is lucky and gain access on the first try. In other cases there may be months of failed attempts before access is gained.

Is there anything that can be done to ease the process of gaining initial access? In the existing model one option is to enhance the rate at which the hook is improved. This can be done in two ways. One can dedicate more effort towards gatekeeper generation. However, normally the resources which one has are limited and as much effort as possible is already dedicated towards this point. One can also try to increase the learning from each attempt to convince a gatekeeper, i.e. to increase *Contact Interaction Hook Improvement Factor*. Ideally, the researcher needs to be a quite a bit of a sales person, a real marketing guy. Still, in most cases, the researcher is given, for example in the case of a doctoral student doing his or her dissertation project. One possible solution is for the researcher to use e.g. his or hers supervising professor's credentials to gain access, i.e. to increase the quality of the hook by referring to a person the gatekeeper trusts or to highly successful projects known to the gatekeeper. However, if one is trying to open up a new avenue of research this may not be a viable strategy.

In some settings the gatekeeper(s) may have a relatively low threshold for facilitating access. In other cases the threshold may be high. A possible strategy is to research problems where the access threshold is low. However, such problems are likely to be trivial and uninteresting. Problems of importance often involve difficult conflicts and the researcher may be turned down many times. Even the most persistent researcher may give up if turned down enough times. Unfortunately, we can give no more advice than that given by (Feldman et al. 2003): Access is influenced considerably by chance, but persistence also plays a major role. Researchers have to put themselves in a position to be lucky (Feldman et al. 2003).

Although, individual researchers starting out may run into all the problems mentioned above, there is something that research organizations can do. A quote from Brown et al. is illuminating: "In general, however, the only important thing for selling is to show existing solutions from earlier work." (Brown et. al 1976, p. 132). Thus, if research organizations work on problems that are important to the community being

researched, and if that research is helpful to them, it should facilitate future access. “I noticed that the countries in the multinational study that had the best network for diffusion to industry also got their sample lined up fastest.” (Brown et al. 1976, p. 158)

The access problem can be challenging, as we have ourselves experienced in our work with information security management, but it is not insurmountable. After all research is being done around the world, dissertations are being produced and important insights arise from them.

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