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# Service Quality through Government Proactivity: The Concept of Non-Interaction

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**Abstract.** In the course of digitalization, governments increasingly aim at improving service quality for their users. To support this aim, government proactivity is considered a suitable approach: reduction of interactions or even non-interaction between users and government. While government proactivity can be crucial for improving the service quality perceived by its users, there is a lacking of understanding how exactly non-interaction interplays with service quality. Understanding this interplay is important, given that for some services non-interaction might also decrease service quality: for instance, non-interactive student loans spare the user the application but at the same time cause automatic debt. We introduce the purpose of an interaction as a lens to help understand this interplay. The lens utilizes the fact that the purpose of an interaction has to be fulfilled also in a proactive, non-interactive version of the service. We operationalize the lens by proposing two groups of interaction purposes and integrating them with service quality dimensions in an analysis framework. The framework can be used to analyze individual services towards their service quality in a proactive, non-interactive version of the service. Our work contributes to theory by developing a set of interaction purposes to study service interactions and the qualitative interplay of non-interaction and service quality on a service level. Based on an exemplary application of the service *free school transport*, we demonstrate how government service designers can adapt the framework into a tool for the evaluation and design of individual services.

**Keywords:** Proactive Government, Service Quality, User-government interactions, Interaction purpose.

## 1 Introduction

Digitalization transforms the way governments deliver public services [1]. Higher service quality, often in terms of efficiency and user-centricity is considered a main objective in this transformation by governments (e.g. [2]). A particular approach that intensively gains traction is proactive government services (e.g. [3]). Proactive services are initiated and delivered by governments proactively i.e. without help of its users [4] and are realized by a fundamental shift in how government works: instead of pulling applications and information from the user, proactive governments push, i.e. automatically and autonomously deliver, services to the user [5]. Hence, proactive governments are considered the next step in government development and the maturity of governments that are proactive is considered the highest [4, 6].

From a user perspective, proactive governments result in reduction or complete absence of interactions to obtain a specific service [7]. Given that interactions such as filling and filing forms are considered cumbersome by users [4] their reduction or complete absence potentially has positive effects on service quality. Arguably, non-interaction can be considered a major factor determining the perception of public service and should be a focus of government efforts to increase service quality.

Despite the suggested importance of non-interaction between users and governments for high-quality service provision, the extant body of research is still lacking a thorough understanding of the interplay of non-interaction and service quality. This is especially relevant because fewer interactions not necessarily result in better service quality. For instance, proactive, non-interactive public student loans in Germany would spare the beneficiary the application effort, but also cause him or her an automatic debt that has to be paid back later. In an attempt to study the current role of interactions in public services, Lindgren et al. [8] compare main characteristics of traditional and digital public service interactions – e.g. purpose and communication – in order to understand digitalization effects. However, these considerations are of limited use for non-interactive services which – by definition – have neither analogue nor digital interactions. Also, not all digital interactions are the same and, thus, their interplay with service quality might differ. A conceptualization of service interactions on a less generic level, which allows for defining a continuum towards non-interaction is lacking.

Based on these considerations, we address the following research questions:

- What is a comprehensive conceptualization of interactions to study the interplay of non-interaction with service quality?
- How can this concept be operationalized in order to analyse services towards improved service quality?

We introduce the interaction purpose as a lens to help understand the interplay between non-interaction and service quality. The lens utilizes the fact that the purpose of an interaction has to be fulfilled also in a proactive, non-interactive version of the service and, thus, allows to study the effects of reducing interactions on service. To this end, we propose a categorization of interactions by their purpose and build an analysis framework for the analysis of services and their quality in the continuum towards non-

interaction. To demonstrate the applicability of the framework, we apply it to exemplary services and discuss the findings.

## 2 Theoretical Background

Proactivity in government is a relatively new focus of e-government literature. The first section of this chapter will give an overview over the existing work and elaborate on how user-government interactions are discussed in this context. The idea of proactive governments is directly connected to the aim of making public services “better” for its users. The question of what makes a service “good” is discussed in the literature under the term “service quality” and will be summarized in the second section of this chapter. Again we will especially elaborate on the interaction perspective in service quality literature.

### 2.1 Proactive government and public services

The notion of proactivity in government has been a topic of research in the context of public services from different perspectives and for different aspects [4–7]. Proactive service provision by governments can be defined as delivering “a service to a citizen when a life event occurs, without the citizen having to request the service” [4]. A government that delivers proactive services is considered user-friendly and improving service quality, since it supplies a service to the user (user-centric) instead of just approving it (government-centric) [4].

The implementation of proactive services has so far been studied from a conceptual perspective and on a government level. Some authors ([4, 5, 9–11]) find challenges and requirements from technical and organizational perspectives but stay on a generic level. For instance, in the stage model of Scholta et al. [4] proactive service delivery affects the storage and use of data inside government. Linder et al. [5] investigate use cases and finds that technology is an enabler for proactive services.

Three levels of proactivity can be distinguished for governments [4, 6]: A reactive government that is not proactive at all, an attentive government that has some proactive aspects, and the fully proactive government that is proactive in all aspects. In a continuous interpretation, proactivity of a service can be seen as inversely proportional to the interaction effort for the user to get the service [7]. Completely proactive services in the spirit of this interpretation are therefore non-interactive, i.e. do not require user-government interaction from user to government whatsoever.

However, the implementation of non-interaction in public services should also consider the user perspective [12, 13]. Non-interactive services are not necessarily positive for the perceived quality of a service by its user. As elaborated in the introduction, services like student loans not only cause benefits but also obligations. To the best of our knowledge, the interplay of non-interaction and service quality has not been extensively studied yet.

## 2.2 Service quality

The user's perception of public services has been widely studied in service quality literature [14]. The quality of a service can be defined as the gap between user expectation and perceived performance [15] and was conceptualized in numerous models and dimensions [12, 16–23].

Papadomichelaki and Mentzas [18] propose the e-GovQual, a multiple-item scale for measuring service quality in e-Government. Following the authors, the quality of a service can be measured along the dimensions efficiency, trust, reliability and citizen support [18]. *Efficiency* considers the ease of use, content and functionality of a service. This includes how findable, organized and how self-explanatory the service is. *Trust* focuses on privacy and security. Exemplary aspects of this dimension are the protection of personal information and the secure transmission of data. *Reliability* touches on correct and immediate performance. I.e. the unrestricted access and speedy executing of a service. *Citizen support* is about the responsiveness and problem solving capacity of a service. The ability of a user to get help when needed and a prompt reply by the government are part of this dimension.

Information exchange and its design play an important role for perceived service quality [24, 25]. For example the design of forms has a distinct effect on service quality [26]. Consequently, the interactions necessary for this information exchange are a perspective on services that has been used in service quality literature. Arias and Maçada [14] find that ease of interaction and service interaction are independent variables which have been proposed to influence service quality. Sá et al. [19] define a service as the entirety of all interactions and Wimmer [27] defines user-government interactions as a layer of public e-services. For the assessment of service quality Jansen and Ølnes [12] synthesize different categorizations of interactions in literature and use them in their assessment framework. However, to the best of our knowledge, the exact interplay of reducing interactions of a public service and its service quality has not been studied yet.

## 3 Research Approach

The research described in this paper was conducted as a qualitative study [28] based on a use case in a research project with the city of Munich and using an argumentative-deductive approach [29]. We chose this approach for two reasons. First, during the research project, in their role as scientific consultants, the authors of this paper were involved in dialogical action. This allowed for an in-depth study of a single case. Second, we aimed at the constructive development of a theory-based concept combining interpretation of work as well as practical inquiry, which motivated the argumentative-deductive approach [29]. In the following sections we describe the case background as well as the literature review, data collection and analysis that fuelled the iterative process in more detail.

### 3.1 Case background

As many cities in Germany, the city of Munich, state of Bavaria, gradually implements digital public services. To this end, the current approach is to provide forms online. Using the German electronic ID and providing electronic payment options, this allows citizens and businesses to apply for public services online. So far the number of digital services is still small, but will continuously increase over the next months and years.

While offering online forms can make applying for public services more efficient and comfortable, the potential of digitalization goes far beyond digital forms. This is why the city of Munich puts effort into increasing service quality to the full extent. Given the novelty of many aspects of this topic in the administration, the city decided to include scientific consulting to help ensure the accordance of their efforts with scientific findings. The goal of the consulting was to provide the city with guidelines for improving service quality. In the course of the scientific consulting the authors were in regular contact to members of a strategic unit within the IT-department of the city which is responsible for the conceptualization of digital services. We had access to relevant documents and contact persons in- and outside the IT department. This provided the opportunity to constantly evaluate our argumentative-deductive findings with experts from practice.

### 3.2 Literature review, data collection and analysis

We conducted a hermeneutic literature review [30] to study the theoretical foundations. As elaborated in the above chapter this includes previous work on proactive government and service quality, both with a focus on interactions. For literature on proactivity we used the work of Scholta et al [4] as a starting point; on service quality the literature review by Arias and Maçada [14].

Based on the theoretical foundations we designed the data collection consisting of two rounds of interviews with domain and digitalization experts from the case municipality and four other municipalities, a workshop and a final interview. The experts for the interviews were selected for their knowledge of a specific service in depth (experts from case municipality) and their experience with a broad range of different public services from an administrative perspective (experts from other municipalities). The case municipality experts are responsible for the review, decision and processing of applications for their respective services. The other four experts have different roles in designing and implementing high-quality e-government services in their respective municipalities. The interviews lasted between 40 and 120 min and were recorded and transcribed if agreed by the expert. For the 4 interviews without recording, notes were taken and converted into minutes. The transcriptions as well as the minutes were sent to the experts for feedback and approval. After the feedback was integrated, the documents were coded by two scientists independently. The data collection was concluded by a 45 min workshop with 30 digitalization experts from all public sector levels at a meeting of public sector experts and a final interview. Table 1 gives an overview over the data sources types, quantity, duration, participants and outcomes.

As for the outcomes, the first round of interviews investigated the user-government interactions and their purpose for three specific services (dog licence fee, registration card, school transport). The services were chosen because they cover different domains of government (tax, registration office, welfare policy). The second round of interviews have been semi-structured interviews with digitalization and service design experts. Their purpose was to generalize from the three specific services to all public services and to investigate the interplay with service quality. The following workshop served as evaluation of the framework by applying it to a variety of services from different public sector levels. The final interview had the purpose of applying the improved framework again to one of the initial services (school transport). The two domain experts were interviewed together because they work on the same public services. One of the two was already interviewed in the first round, the second one was added to ensure a comprehensive perspective.

**Table 1.** List of data sources

Data type	Quantity	Duration	Participants	Outcome
First round of interviews	3	90 -120 min	5 domain experts from the case municipality	Purposes of service interactions
Second round of interviews	6	40 - 75 min	2 digitalization experts from case municipality + 4 digitalization experts from 4 other municipalities	Generalization of interaction purposes and first draft framework
Workshop	1	45 min	30 digitalization experts from all public sector levels	Consolidated framework
Final interview	1	120 min	2 domain experts from the case municipality	Exemplary application of the framework

## 4 The analysis framework

### 4.1 Categorization of interaction purposes

We used the comparison of traditional versus digital public service characteristics by Lindgren et al. [8] as a starting point. The authors build on a classification of interaction aspects by Goodsell [31] to illustrate the effect of digitalization on the nature and purpose, the communication form and setting, the central actors involved, and the initiation, duration, and scope of an interaction. These aspects serve well for the investigation of a change in interactions, e.g. when service are digitalized. Yet, when services become more and more proactive, interactions will be reduced. The investigation of proactive, non-interactive services using interaction aspects therefore becomes less apparent. Hypothetically, for a government with fully non-interactive services only, the analysis by Lindgren et al. cannot be applied properly. However, in order to move from current interactive towards non-interactive services, the current purpose of interactions has still

to be fulfilled somehow - except this time without the user. This allows for investigating the quality of a service through understanding the non-interactive fulfilment of typical interaction purposes in proactive services. For instance, most services are triggered by submission of a form. This interaction purpose now has to happen without a user, which affects service quality. While reducing the application effort, this change requires the user to trust the administration to trigger the service when needed. Depending on how the purpose of service triggering is implemented in a non-interactive service, the users trust in government will be affected positively or negatively. Consequently, the implementation of purpose fulfilment influences service quality and, thus, this lens might be of value for understanding the interplay of non-interaction and service quality.

Investigating three services from the case municipality and based on two rounds of interviews we found seven interaction purposes grouped into data provision and support functions (cf. Table 2).

**Table 2.** List of user-government interaction purposes and their descriptions.

Interaction purpose	Description
<b>Data provisions</b>	
Specification	Provision of data that specify the requested service, e.g. type of license
Eligibility	Provision of data that prove the qualification of the user to receive the service in question, e.g. physical handicap
Identification	Provision of data to identify a potentially eligible person, e.g. name and address of resident
<b>Support functions</b>	
Trigger	Initiates the service, e.g. via application form
Authentication	Proves the identity of a person to the authorities, e.g. authentication by eID
Payment	Payment of fees, taxes or other, e.g. by direct debit
Logistics	Move physical object from one place to another, e.g. pick up a public transport ticket

The group “data provisions” includes three types of purposes. Data for *specification* is used by the government in order to identify the exact service the user needs. An example from the investigated services is the race of a dog in the dog licence fee service. This information is provided in the application form and determines whether the owner has to pay the fee for fighting dogs, which is higher, or normal dogs. Data for *eligibility* includes all data necessary to determine whether the user fulfils the requirements for the service. An example requirement from the school transport service is a physical handicap that prevents a pupil to walk to school. The applicant has to provide a document to prove that the pupil fulfils this requirement. Data for *identification* is a common data provision required in many government forms. An example is the application for the registration card. In order to get this document the user has to identify him or herself by providing name and address. Based on the identification the government understand which registration card to issue.



The group “support functions” include four types of purposes. The *trigger* of a service is the initiation of the according process that leads to service provision. All three mentioned services have this requirement. For the dog licence, the school transport as well as the registration card the user has to indicate to the government his or her need for the service. In cases of all three services that happens via submission of the according form. *Authentication* is another interaction purpose of government services. An example is authentication by ID card. In case of the registration card, authentication can be done via use of the online function of the ID card. By electronically proving the possession of the card and a second factor (PIN) the user can authenticate for the service. The third provision type is *payments*. Payments can be necessary interactions in order to settle fees or taxes. In case of the dog fee the user has to allow the authorities to retrieve the fee from the user’s bank account via direct debit. Finally, *logistics* are required to move physical objects such as documents from one place to another. For instance, government requires that pupils pick up the ticket for school transport in school.

#### 4.2 A framework for the analysis of services towards increased service quality

We present a framework for the analysis of services with two dimensions. The first dimension uses the lens of the interaction purposes and the second consists of service quality dimension. For the quality dimensions we use the ones proposed by Papadomichelaki and Mentzas [18] under the label e-GovQual. We chose these dimensions – efficiency, trust, reliability, and citizen support – for their orthogonality to the interaction perspective which avoids interdependencies of the framework dimensions. To include all users of public services – also companies and organizations – we renamed the latter dimension “user support”. The resulting framework is shown in Table 3.

For each interaction the framework allows to evaluate how a proactive, non-interactive fulfilment of its purpose interplays with service quality via its dimensions. This allows to break down the interplay of non-interaction and service quality into aspects by interaction purpose and to consider it for different dimensions. We filled the cells of the table with aspects that arise for each intersection. The questions are intended to provide an example of an aspect of non-interaction that might affect a service quality dimension. This aspect can be used as a first impulse to evaluate the effects of reducing interactions that serve a specific purpose.

For the *trust* dimension we find aspects that can be attributed to the loss of control by the user, resulting from the non-interaction. For instance, in case of a non-interactive service specification by the government, the user might wonder whether that specification is best for his or her circumstances. Given the lack of interaction, the user has to trust government with this decision. Another example is the interaction purpose of authentication. Its non-interactive fulfilment might require the government to access private user data. This access and potential exploitation interplays with the perceived service quality via the trust dimension.

**Table 3.** Framework for the analysis of services and their quality in the continuum towards non-interaction

Non-interaction	Service Quality Dimensions			
	<i>Trust</i>	<i>Efficiency</i>	<i>Reliability</i>	<i>User Support</i>
<b>Data Provisions</b>				
<i>Non-interactive Specification</i>	Best specification for user?	Effort for corrections necessary?	Specification correct?	What if specification wrong?
<i>Non-interactive eligibility</i>	Benevolent or strict?	Can be automated?	Assessment correct?	How to object?
<i>Non-interactive identification</i>	Privacy protection met?	Minimal possible amount of ID data?	Identification immediate?	What if not considered?
<b>Support functions</b>				
<i>Non-interactive trigger</i>	False trigger possible?	Extra effort to enable proactive trigger?	Trigger immediate?	How to manually trigger?
<i>Non-interactive authentication</i>	Privacy protection met?	New technology necessary?	Authentication correct?	How to object?
<i>Non-interactive payment</i>	Unexpected costs possible?	How big is verification effort?	Payment immediate?	Possibility to know payments in advance?
<i>Non-interactive logistics</i>	Confidentiality?	Lost resources due to erroneous service delivery?	Address correct?	Support information available from logistic 3 <sup>rd</sup> parties?

For the *efficiency* dimension we find aspects that consider side-effects of non-interaction. A non-interactive fulfilment of an interaction purpose might require some change in behaviour by the citizen to enable or control the alternative fulfilment. The immediate, non-interactive triggering of garbage collection, for example, might only be possible if a user notifies the registry office about moving in advance and not only within the legal deadline of two weeks after. As for the control, non-interactive payments want to be checked by the user for correctness which causes extra effort. Both necessary change in behaviour and controlling government actions interplay with service quality via efficiency.

For the *reliability* dimension we find aspects that address the correctness and timing of non-interactive purpose fulfilment. E.g. the non-interactive eligibility assessment has to be done without any direct input from the user. The correctness of this assessment interplays with the quality of the service via the reliability dimension. Similarly the immediacy of a purpose fulfilment, e.g. the identification of a user for a service, interplays with reliability and, thus, service quality.

Finally, for the *user service* dimension we find aspects that concern the situation in which – even though designed to be non-interactive – the user has to act. E.g. if a service is not triggered although needed or if a service is not specified in the best interest of the user this requires some form of user-government interaction. In this case, the quality of the service is affected through the user support dimension, i.e. the support of the government to these situations.

## 5 Discussion

### 5.1 Implications for theory

The findings of this paper show that non-interaction interplays with service quality in a non-trivial way. While less interaction effort can have benefits for the user, the reduction of interactions might also have downsides such as trust or reliability aspects. Consequently, simply understanding non-interactivity as reducing interaction efforts for the user might not allow for a comprehensive understanding. In this line of argument, proactive government also not necessarily has to have the highest maturity as has been suggested [6]. The precise effects of proactive government on service quality should be considered in these considerations.

For the non-trivial nature of this interplay with service quality, we find that the lens of interaction purposes can help exploring its qualitative connections and correlations on a service level. The consideration of interactions by purpose allows to break down this interplay into different aspects, i.e. different purposes and their non-interactive fulfilment have different interrelations with different quality dimensions. We find that grouping purposes by information exchange, service provision and control or constraint as proposed by literature [8] is a useful starting point and can be operationalized by distinguishing seven purposes grouped into data provisions and support functions.

Finally, the existing conceptualizations of service quality can help understanding non-interactive services - even though the concepts were designed for interactive services. This reflects well on the assumption by literature that the evaluation of service quality is not changing from no-proactive to proactive government since it is still the users perception that counts [6]. However, this is only the case for a qualitative evaluation. As for quantitative assessment the questions proposed to quantify the used dimensions consider the interaction environment [18] and, hence, are not applicable to non-interactive services.

### 5.2 Implications for practice

Practice can use the presented lens to analyse interactions of existing services towards non-interaction. The framework then can help design a version of the service that is non-interactive *and* has high service quality. This can foster the spread of proactive government. We demonstrate these implications by applying the framework to the exemplary service of free school transport. In Bavaria, the transport of pupils to and from school is free of charge by law [32]. The city of Munich puts that into practice by - upon application - providing tickets to pupils for their daily commute to school. The application is operationalized via form in the online portal of the city. The city checks the eligibility depending on a minimum distance to school, physical handicaps and potential danger zones on the way to school. All approved applicants can pick up the ticket at school.

The domain experts from the city consider the service to be suitable for a fully non-interactive implementation. The non-interactive implementation would use data from the public school data base and automatically check the eligibility for all students before

the beginning of the school year. However, despite the assumption that saving the application effort for the user will increase service quality, the exact interplay of reducing interactions and service quality remains unclear.

Using the presented distinction of interaction purposes the experts can investigate the current interactions of the service and consider the potential non-interactive fulfilment of the purpose. For the service of free school transport three interactions can be distinguished. Organizing documents to prove eligibility in case of physical handicaps, the online application and the pick-up of the ticket in school. While the first interaction serves only the purpose of providing data on eligibility, the online application has multiple purposes. The corresponding form requires all types of data provision (specification, eligibility and identification) and acts as a trigger of the service. The pick-up in school fulfils the authentication and the logistics support functions. There is no interaction that fulfils the purpose of payment because for the service in question no payment is necessary.

**Table 4.** Application of the framework to the free school transportation service

<b>Non-interaction</b>	<b>Service Quality Dimensions</b>			
	<i>Trust</i>	<i>Efficiency</i>	<i>Reliability</i>	<i>User support</i>
<b><i>Data Provisions</i></b>				
<i>Non-interactive Specification</i>	Same ticket for all pupils	-	Same ticket for all pupils	-
<i>Non-interactive eligibility</i>	-	Communication of danger zones among authorities might take time	Immediacy has to be ensured	Fast help in case of wrong refusal necessary
<i>Non-interactive identification</i>	Access to state school data base necessary	-	-	.
<b><i>Support functions</i></b>				
<i>Non-interactive trigger</i>	-	No application necessary	Provision at first day of school	-
<i>Non-interactive authentication</i>	-	No authentication necessary	-	-
<i>Non-interactive payment</i>	-	-	-	-
<i>Non-interactive logistics</i>	-	No pick up in school	Need to send tickets to right parent	-

Based on these interaction purposes and their potential non-interactive fulfilment, we evaluated versions of the service towards their interplay with the service quality dimensions of the framework. For instance, a non-interactive *eligibility* check, interplays with efficiency in two ways. On the one hand, not having to provide respective documents and evidence saves time and effort for the user. On the other hand an eligi-

bility check without those documents might need more time. This also affects the reliability of proactive eligibility checks. If inefficient processes inside government take time, the immediacy of the service is not guaranteed and, thus, affecting its reliability. An important aspect of proactive eligibility checks is its reliability in terms of accuracy. If the ticket is refused wrongfully, the support of affected users can make a difference in the perceived quality of the service. A negative aspect of non-interactive tickets can occur from a data privacy point of view. The reduction of interactions is partly enabled by sharing data between schools and other administrations. The exact implementation of this sharing might affect the trust dimension of the service.

All considerations made are present in Table 4. Based on these considerations we developed a version of the service that is non-interactive and has a high service quality. In this version the ticket is automatically sent to all pupils before the first day of school every year. The eligibility check is realized by inter-organisational cooperation and economic data use. User support is established to help in case of wrongful refusal within 24 hours.

## **6 Conclusion and Outlook**

In this paper, we present the interaction purpose as a lens to study the interplay between non-interaction and service quality. To this end, we build a framework for analyzing public services towards their quality in a non-interactive version. The framework uses the lens of interaction purposes and four dimensions of service quality. We discuss implications for theory and practice. The latter is done by means of applying the framework to an exemplary service.

The findings of this paper have limitations that restrain their general applicability and should be met with further research. Interaction purposes are not the only lens on services that might be helpful in investigating the interplay of non-interaction and service quality. Other lenses and perspectives should be evaluated towards their contribution to this discussion. Also, the results of this paper were developed with experts from government. The user perspective mainly relies on insights of service quality literature. This literature was mostly established based on interaction-based services. Further research should reiterate on the suitability of service quality models and dimensions for evaluation of proactive, non-interactive service quality and include users directly. Moreover, the current framework allows only for qualitative assessment of services. Further works should aim at making these assessments quantifiable, also to enable assessing the suitability of services for proactive delivery which would help decision makers in practice. For theory as well as practice, it would be especially interesting to investigate the relationships between individual interaction types and the service quality dimensions. Finally, broader aspects such as the technical implementation of non-interactive services – e.g. elevated security threats because of centralized data storage and data privacy – are important and should be addressed as well.

Although limitations exist, we believe that our research is valuable to both theory and practice. In particular, we hope that the application of our framework will streamline the transformation of digital government services towards more high-quality proactivity.

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