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# “질적연구방법론 : 문화와 해석”

- 일시 2015년 11월 14일(토) 10:00~18:00
- 장소 중앙대학교 R&D 센터(102관) 201호
- 주최 한국질적연구학회
- 주관 한국질적연구학회 · 중앙대학교 사회학과 BK21플러스<sup>+</sup>사업단  
한국성인계속교육연구회 · 한국문화교육학회

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한국성인계속교육연구회 · 한국문화교육학회

한국질적연구학회

**Technology acceptance of elderly users  
and social inequalities in Germany  
– Results of a qualitative study**

**Peter Enste** (Research associate, Institute for Work and Technology, Germany)

**Sebastian Merkel** (Research associate, Institute for Work and Technology, Germany)



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# Technology acceptance of elderly users and social inequalities in Germany – Results of a qualitative study\*

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Peter Enste\*\* & Sebastian Merkel (Institute for Work and Technology, Germany)

## Abstract

Technology acceptance of older users is influenced by numerous factors, including determinants of social inequalities such as low income or poor education. Though this influence has been highlighted in previous studies, little is known about how social inequalities affect technology acceptance. In addition, not much emphasis has been put on explaining the reasons behind and implications for the development and design process of products and services for older persons. Therefore, it was the aim of this study to analyse determinants that affect adoption and use of products and services designed for older persons.

## 1. Background

Information and communication (ICT) based technologies have the potential to support daily life activities and have become of growing importance in ageing societies. Especially concerning (health)care of older persons, many modern societies increasingly rely on those technologies such as telecare, telehealth or ambient/active assisted living. However, there is often a lack of acceptance among the target group. This is especially true considering socially weak members of society that only have limited financial and/or educational resources. We describe this as the “dilemma technology use”: Those who could profit

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\*\* Presenter

most, e.g. because they are living alone and need support, cannot access such technologies or simply do not use them.

The fact that inequality factors (e.g. education, age, income, etc.) have an impact on technology acceptance has been proven previously. Still, the question how these factors influence the use of technology has not been examined before. To do so, a stronger focus on the micro level is needed (Beil et al. 2013; Pelizäus-Hoffmeister 2013; Sackmann & Weymann 2004; Sackmann 1993). To answer our main research question – how determinants of inequality effect the technology acceptance of individuals in later life – we chose a qualitative approach focusing strongly on the determinant chronological age.

## II. Research design

### 1. Data collection

We conducted 17 problem-centered interviews with older participants in Germany. The problem-centered interview was developed by Witzel, who describes it as “a theory-generating method that tries to neutralize the alleged contradiction between being directed by theory or being open-minded so that the interplay of inductive and deductive thinking contributes to increasing the user’s knowledge” (Witzel 2000: 1). Each interview was structured as followed: After collecting data on social characteristics (sex, household size, age, etc.), we started our interviews with a pre-formulated introductory question to focus the interview on the problem of our study and to stimulate the interviewees to start a free narrative:

*“We are interested in your personal experience with technology. What different technologies played an important role in your life? Please start from your youth and continue until today.”*

The second part of the interview started when the interviewees finished their narratives. In this phase of the interview the interviewer got a more active part. To compare the interviews with each other, we prepared for the second part an interview guide, which was developed further during the research process.

### 2. Sampling

Participants were sampled based on the determinants of social inequality. Each participant had to meet at least two out of the following criteria: being female, living alone, being older than 80 and having a low educational attainment. In addition, each interviewee had to be capable of the German language and had to be at least 60 years old. Participants were selected randomly and purposefully based on the inclusion criteria. To discover variations among our target group we conducted our interviews in two waves. The sampling of our first wave followed our determinants of social inequalities. The sampling of the second wave also considered the results of the interviews of the first wave.

〈Table 1〉 Sampling criteria

First wave	Second wave
12 participants	5 participants
Focus on	
Living alone	
Female (14)	Male (3)
Average income (13)	Very low income (4)
Average and low education level (14)	Very low education level (3)

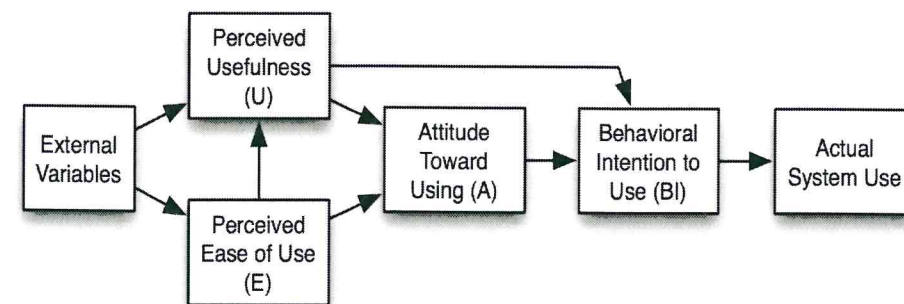
To recruit potential participants we used contacts from previous projects such as senior citizen representatives/seniors offices or NPOs working with older persons. Prior to the interview, the respondents were contacted via telephone to discuss the background of the project and further details. The interviews were fully transcribed. Each transcript was analysed using qualitative content analysis two researches, who also conducted the interviews, independently worked through approximately 25 % to develop a first version of a coding scheme. After coding approximately 40 % of the data, we revised and refined the coding scheme; conflicts were solved through discussion. As a last step, the complete material was coded based on the final scheme using MAXQDA 11. The final coding system contains both deductive and inductive categories.

### 3. Theoretical background for derivation of deductive categories

The connection between the actual use of technology and the attitude towards these technologies is described by the Technology Acceptance Model (TAM) developed by Davis.



The TAM is based on the thoughts of the theory of planned action and adapts this theory to the use of technology:



[Figure 1] Technology Acceptance Model (Davis 1985)

According to Davis' model, technology acceptance is significantly determined by two factors: Perceived usefulness is described as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis 1989: 320). Perceived ease of use is defined by Davis as "the degree to which a person believes that using a particular system would be free from effort" (Davis 1989: 320). Studies prove that both factors correlate with the use and the self-predicted use of technologies in the future. The TAM has been used in various contexts and has been modified multiple times. Chen and Chan (2012) developed a modification of the TAM that tries to predict the acceptance of technologies by older persons. They come to the conclusion that "most older adults have positive attitudes towards technology; however, they do not show great interest in adopting new technology and are less likely to use technology than younger adults" (Chen & Chan 2012: 3). To better understand the reasons behind the non-adoption of technology by older persons, additional variables such as abilities and problems experienced should also be considered. Neyer, Felber & Gebhardt (2012) developed the model of technological commitment with a stronger focus on personality traits, which explains individual differences in the willingness of technology use in terms of three facets: technology acceptance, technology competence and technology control.

There is no doubt that age has a significant influence on the adoption and use of ICT-based technologies. Using smartphones to go online is widely spread among younger people, older people have trouble to adopt this technology: While one quarter of the

"younger elderly" (aged 55 to 64 years) uses the internet via smartphone, 85% of the very old people never did so.

〈Table 2〉 The use of internet by smartphone in Germany 2014, differentiated by age (Federal Statistical Office)

Age	Daily use
55 - 64 years	23,5%
65 - 74 years	11,5%
75 years and older	5,0%

Sackmann and Weymann (2004) describe four technology generations which are characterized by certain key-technologies (Sackmann 1996; Sackmann & Weymann 2004). Table 3 shows those key-technologies as described by the authors. We added there a fifth generation named "mobile digitalization" due to the spread of mobile devices such as smartphones and tablets.

〈Table 3〉 Technology generations  
(own figure, based on Sackmann & Weymann 2004)

Participants	Timeline	Era	Central Innovation
15	1920	Pre-technical era	Electricity in households Radio
2	1960	Household revolution	Washing machine Car TV
		<i>Spread in households</i>	
	1980		
		Digitization	
	1990		PC
		<i>Spread in households</i>	
			Internet
	2000	<i>Spread in households</i>	
		„Mobile Digitalization“	Tablet-PC Smartphone
	2010	<i>Spread in households</i>	



### III. Results and discussion – Age and generation as a dimension of social inequality

It turns out that the following categories related to the determinant of inequality of chronological age:

〈Table 4〉 Categories influenced by chronological age

Deductive	Perceived usefulness
	Perceived ease of use
	Technologygenerations und –biography
	Self-efficacy
Inductive	Self-image of age
	Fascination with technology
	Service and support
	Modern versus old technology („Miele Mentalität“)

Regarding to the model of technology generations most respondents of our sample belong to the “pre-technical generation. For this group the perception of technical gadgets matters less. They were middle-aged when the following “Generation of Household revolution” started. Members of this generation has already dealt with technization at an early age and gained some experience with technical devices. The so called “younger elderly” technical devices for granted in their everyday life. Furthermore studies show that the contact within this generation can be very different due to individual experiences in life

The respondents reported that the first initiation with technology happened during their childhood with the radio. Respondents, who experience the Second World War named the Volksempfänger as the dominant technical aspect of their early lives and was mostly attributed with positive aspects:

*“This was something really special! The whole family sat together listening to the program. We also laughed! It was really exciting.” (Interview 5)*

A further outcome is the individual experience in the daily family life. They reported about a critical attitude of their parents towards modern technology:

*“My father always said: Radio? Why do we need a radio? We have six children, that is enough radio.” (Interview 4)*

*“I remember that my parents often said: If you want a radio, you should open the window!” (Interview 8)*

But this critical attitude could also be influenced because the Volksempfänger was used as a propaganda tool of the NS regime in Germany:

*“I remember that the Volksempfänger was very cheap. The Führer’s idea was that everyone had to listen to his news.” (Interview 10)*

However, this statements also show that people, who belong to a generation with no technical experience, were sceptical about new technology and developments. A critical attitude could be adopted because the benefit was not recognized. This could be an indication for acceptance problems for older generations with new key technologies.

Similarities can be noticed here today: New developments from the field of ICT, which are mainly perceived from their children and grandchildren, are often referred to as unhelpfully. The respondents do not see any sense in dealing with the new technology (e.g. Computer, Smartphones) because the benefit for their personal situation is unnoticed and the contact is experienced rather negatively:

*“My grandchildren just sit there and keep typing on their mobile phones. I feel like they are not even able to talk to each other normally anymore.” (Interview 13)*

But there was also another side: They report that parents and grandparents have realized the benefit of the radio: Especially during the war, the radio was used as an important source of information in order to be informed about the events of the day (e.g. air raid warning). The experiences with technologies at the time are mostly positive: With help from radio- and television broadcasts, they were able to get to know the world much better. Modern technology can be seen as a “gateopener” to the modern world. Furthermore, watching TV together became some kind of family event:

*“For the first couple of years, we had no television at our home. Therefore we met at my aunt’s place every now and then and watched TV all together. This was always very exciting especially for us children.” (Interview 11)*

A strong influence on the use of technology played the professional background and their experience with technology in their working life of the interviewees. Most of the respondents, especially female persons, missed the introduction of information technologies (digitalisation) during their working life, but experienced other forms of technology, mostly from the wave of household technology. The introduction of modern digital technologies



such as smartphones or computers was usually initiated by relatives, children or grandchildren, but also by younger peers.

The benefit from household gadgets is rated particularly high. The introduction of the washing machines is described as a huge work simplification.

*"Of course it was a simplification! We often spent two days in the laundry room of our house and the washing machine does this in not more than two hours!" (Interview 15)*

It was also a simplification in the young family life:

*"We have three children nearly in the same age. My daughter was two years and we had the baby twins. So I had a lot of work with the swaddling clothes. I had to make the hand washing and I dried them on the open fire in the kitchen. Later, when we got a washing machine and we had our younger son, it was really easy." (Interview 9)*

The respondents were fascinated by the new form of household technology:

*"The first times when we used the machine the whole family sat in front of it watching how it works. It was like watching an exciting movie." (Interview 10)*

Using modern technology like a clothes dryer was also seen as some kind of privilege to be proud of it:

*"My aunt was working in a restaurant kitchen. She brought us some electrical equipment. At that time you could not buy it in the stores. A lot of people were jealous." (Interview 10)*

*"We did not have a lot of money in the early years. When the financial situation was better, my husband said that it is now the time for buying a new machine and a dryer." (Interview 3)*

But participants also mentioned critical aspects which can be summarized as losing social contacts and communication by using modern technology instead of classical handmade work:

*"I loved it to wring the sheets together with my husband. He was a very funny man and we always had a lot of fun during this." (Interview 8)*

*"We did not need any entertainment systems. When we had to make the washing we set together singing songs and talking about a lot of things." (Interview 9)*

During the household revolution the respondents made good experience with the longevity of technical products:

*"Our first washing machine did last very long. When there was a problem we could always fix it." (Interview 10)*

*"The technology of the TV was very simple. We have no problems with it and it was very easy to understand. We did not need any endless instruction manuals." (Interview 15)."*

*"The telephone was very easy to understand. You had to dial the number and that was all! No constant updates and other entire stuff. The product was finished when we bought it." (Interview 13)*

This attitude can be described as "Miele Mentality" (Miele is a famous German company, which produces washing machines with a large longevity). This attitude can be seen as a barrier for the acceptance of new ICT-products.

*"My HiFi system is not so old, I think 18 or 20 years. But the CD player is out of order and I have asked in a store if it is possible to repair. But the man said that there was no longer any point in trying to fix it. But it was not so cheap when I buy it years ago!" (Interview 7)*

The support system of modern ICT-technology can be seen as a burden for older people:

*"A friend of mine has always problems with his PC. There are always updates and other new things, he is often helpless with all this stuff. I cannot understand why the companies produce always unfinished equipment." (Interview 2)*

Another barrier can be seen in the image and the self-image of old age:

*"At the age of 80 I thought it was too late to use a computer. Now I'm 90 and it is really too late." (Interview 4)*

*"Computer? That is nothing for older people!" (Interview 8)*

The respondents see a contrast in being old and using computer:

*"I don't want a computer. What should I do with a computer? I don't need to write Emails, I can write a letter and if I need some entertainment I can read a book. Furthermore I have heard for several times that old people were ripped off by the internet." (Interview 11)*



The self-image has a high influence on self efficacy. Regarding to technology acceptance self efficacy can be seen as the extent of one's belief in one's own ability to gain with modern ICT-products:

"I'm too old. I'm not able to use a computer or a smartphone. This things are too complicated." (Interview 9)

"When there is a problem with my new TV, I won't even attempt to fix it on my own. I will asked my son in law or my grandchildren...they will fix it in a few minutes. But for me it is too complicated and furthermore I'm not interested in doing it." (Interview 15).

#### IV. conclusion

It is unquestionable that ICT-based products and services have the potential to support the process of active and healthy ageing and can foster economic growth and employment. Still, there are multiple prevailing issues hindering the uptake of such approaches. As pointed out, challenges exist in various terms. From a gerontological point of view, the barriers related to the acceptance have to be considered as the most important. Compared to younger generations, the use of technology by older persons is less distinctive, especially in terms of 'advanced technology' like smartphones or tablet PCs. Though this tends to change with future generations there will always be people having problems in dealing with technology - not only in old age. Especially those who could benefit most from technologies often have no access to promising products and services. On the one hand innovative solutions can help people to participate in their community and hence support social inclusion; on the other hand technology can cause social inequalities and ultimately lead to social exclusion. Against this background, technology itself can be seen as a dimension of social inequality.

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# **“Technology acceptance of elderly users and social inequalities in Germany – Results of a qualitative study” 에 대한 토론**

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양 영 자 (경남대학교 사회복지학과 부교수)

본 토론자는 영문 원고에 대한 번역문이 별도로 제시되지 않은 채 논문이 발표된다는 점을 고려하여, 먼저 연구자들이 발표한 논문의 주요 내용들을 정리하여 소개한 다음, 논문 내용과 관련하여 몇 가지 제안을 하고 종합적인 평가를 하는 것으로써 토론 내용을 구성하고자 합니다.

## **I. 연구의 목적**

이 논문의 연구 목적은 노인들이 ICT 상품과 서비스를 이용하는데 영향을 미치는 요인이 무엇인지 분석하는 것이었습니다. 이러한 목적 설정은 기존의 선행연구들에서 노인들의 기술수용도는 교육과 수입, 연령 등과 같은 여러 사회적 불평등 요인들에 의해 영향을 받는다는 것이 밝혀졌지만, 이러한 사회적 불평등 요인들이 노인들의 기술수용도에 구체적으로 어떠한 영향을 미치는지에 대해서는 밝혀진 바가 매우 제한적이기 때문이라고 하였습니다. 이러한 연구 목적 설정은 기존 선행연구와 차별성을 담보한 것으로 이 논문의 독창성을 확보하는 데에 성공했다고 판단됩니다.

## **II. 연구방법**

### **1. 자료수집 방법**

자료수집 방법은 Witzel(1982)의 문제중심인터뷰 방법이었습니다. 문제중심인터뷰는 Witzel이 1982년 개발한 것으로서, 연구참여자가 일상적인 대화를 할 때처럼 가능한 한 자유롭게 이야기하도록 하되, 인터뷰실시자가 제기한 일정한 문제들에 대해 집중적으로 이



야기하도록 하는 인터뷰 방식입니다. 따라서 인터뷰실시자는 인터뷰 전에 미리 연구주제와 관련하여 분석한 일정한 문제들을 중심으로 모범인터뷰 질문을 만들고, 이를 바탕으로 인터뷰를 진행시키되 개방적인 인터뷰가 되도록 해야 하는 인터뷰 방식입니다(Mayring, 1990: 46).

연구자들은 문제중심인터뷰 방식을 따르되, 연구참여자들이 어떠한 기술 관련 경험을 하였는지, 청소년기 때부터 현재에 이르기까지 이야기하도록 하는 도입질문을 하는 것으로써 인터뷰를 시작하였고, 이후 모범인터뷰 질문에 따라 인터뷰를 실시했던 것으로 보입니다.

그리고 모범인터뷰는 이론적 배경에서 제시한 Davis(1985)의 기술수용모델, Chen과 Chan(2012)의 수정기술수용모델, Neyer, Felber 그리고 Gebhardt(2012)의 기술유능성모델, Sackmann과 Weymann(2004)의 기술세대모델에 기초하여 연역적 절차에 따라 구성한 것으로 보입니다. 그러나 모범인터뷰 질문지를 구체적으로 어떠한 내용으로 구성하였는지, 이에 대해서는 제시하지 않고 있습니다. 모범인터뷰 질문들을 제시한다면 신뢰도와 타당도를 높이는 데에 도움이 되리라 생각합니다.

## 2. 자료분석 방법

자료분석 방법은 질적 내용 분석 방법으로서, MAXQDA 11를 활용하여 범주화하였다고 하였습니다. 그리고 범주화한 내용은 연역적 및 귀납적 절차에 따른 것으로, 표4로 제시하였습니다.

## III. 연구결과

연구결과는 위의 범주들에 따라 논의하고 있는데, 그 핵심적인 내용은 다음과 같이 정리할 수 있습니다.

첫째, 연구참여자들의 연령에 따른 기술세대(Sackmann and Weymann, 2005) 구분과 관련한 내용입니다. 대부분의 연구참여자들은 기계세대 이전의 세대, 즉 ‘전기기술세대(Vortechnische Generation)’에 속한 사람들이라고 하였습니다. 따라서 이들은 유년기에 기기를 그다지 경험하지 못했는데, 중년기에 이르렀을 때에는 이미 가전제품의 혁명 세대에 속한 연령층이 되었다고 하였습니다.

둘째, 전기기술세대에 속한 연구참여자들이 기술제품에 대해 경험한 주요 내용입니다.

이들이 접한 첫 기술제품은 라디오(Volksempfänger)라고 하였습니다. 라디오에 대한 이들의 경험은 대체로 긍정적이었던 반면, 이들의 부모들은 신기술에 대해 비판적인 태도를 취하였다고 하였습니다. 부모들의 신기술에 대한 비판적인 태도는 한편으로는 Volksempfänger가 나치정부의 선전기구로써 이용되었다는 점을 인식한 것과 연관이 있고, 다른 한편으로는 이들 부모들처럼 기술에 대한 경험이 없는 세대들은 신기술에 대해 회의적인 태도를 취하

였는데, 이는 신기술의 유용성을 인식하지 못하고 있거나 저평가하고 있는 것과 연관이 있다고 하였습니다. 그리고 이러한 노인들의 신 핵심기술에 대한 낮은 수용도의 문제는 현 노인세대에서도 유사하게 나타난다고 하였습니다. 그러나 이들 부모 세대들도 기기의 유용성을 어느 정도는 인식하고 있었는데, 이는 특히 2차 세계대전 중에 라디오가 중요한 정보를 전달해주는 기능을 하였기 때문이라고 보았습니다.

라디오와 TV는 연구참여자에게 의해 대체로 ‘새로운 세상으로 나아가는 문을 열어주는 안내자 역할(Türöffner)’을 하는 것으로 긍정적으로 인식하고 있다고 하였습니다.

직업적 배경도 기술의 수용도와 관련이 있다고 하였습니다. 연구참여자들 중 여성노인들은 직장에서 컴퓨터와 같은 기기들을 전혀 다루어본 적이 없다고 하였는데, 바로 이러한 직업적 기기에 대한 무경험이 낮은 기술수용도와 연관이 있다고 하였습니다.

세탁기를 접한 경험은 특히 긍정적으로 평가되고 있다고 하였습니다. 빨래 시간을 현저히 단축시켜 가족생활에 긍정적인 영향을 미친 점, 신기술 제품에 대한 매력 및 세탁건조기와 같은 신기술 제품을 구매할 능력이 있다는 특권의식 등이 이러한 긍정적인 경험이라고 하였습니다. 그러나 세탁건조기를 갖게 되면서 남편과 함께 세탁물을 손수 짜며 가졌던 즐거운 추억과 같은 가족 간 교류 등은 오히려 감소하게 되는 아쉬움도 남겼다고 하였습니다.

한편, 가전제품의 혁명 시기에 나온 기술제품은 견고성이 뛰어난데다 이용방법도 간단하여 매우 긍정적으로 평가되었다고 하였습니다. 그러나 바로 이러한 기술제품의 견고성을 경험한 것이 오히려 이들의 현 ICT 제품에 대한 수용도가 낮은 것과 연관이 있을 수 있다는 것을 ‘밀레 멘탈’이라는 개념으로써 설명하고 있습니다.

또한 지속적으로 업데이트를 해야 하는 현 ICT 제품의 서비스 구조도 노인들의 기기이용도를 제고하는 데에 장애가 되고 있다고 하였습니다.

그 외, 노인상과 노인들의 자기상도 마찬가지로 노인들의 기기이용도 및 자기효능감 제고에 장애가 되고 있다고 하였습니다.

요컨대, 노인들의 ICT 상품과 서비스 이용에 영향을 미치는 요인은 신기술의 유용성 인식 여부, 기술을 다루어본 직업적 배경의 여부, 가족생활에 미치는 기술의 영향, 견고성을 갖춘 기술제품에 대한 경험, 서비스 구조, 노인상과 노인들의 자기상 등이었다는 것입니다.

## 4. 결론

이상에서 논의한 바와 같이 이 연구에서는 접근 방법의 측면에서 몇 가지 문제점이 노정되고는 있지만, 이 연구의 본래적인 목적은 달성되었다고 봅니다. 특히, 연구자들이 이러한 연구결과에 기초하여 ICT 상품과 서비스를 실질적으로 필요로 하는 계층은 소득수준이 낮고 저학력이며 연령이 많은 노인들인 반면, 정작 이들은 ICT 상품과 서비스에 접근하는 것이 여러 가지 이유로 어렵다는 점을 환기시키며, 혁신적인 해결책을 통해 ICT 상품과 서

스의 이용을 촉진할 수 있어야 하고, 또한 이러한 노인들이 기술을 이용하지 않는 것 자체가 사회적 불평등을 가속화시키고 결국 사회적 배제를 초래할 위험성이 있다고 경고하며, 기술이용 자체가 사회적 불평등의 한 차원임을 환기시킨 점은 이 논문이 제시한 매우 의미 있는 함의점이라고 판단됩니다.

## 정치학 연구에 있어서 정치문화기술지의 활용 가능성

김 현 준 (연세대학교 정치학과 박사과정)

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