

# Assessment of Future Workshop's Usefulness as an Ergonomics Tool

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*This study was carried out to assess Future Workshop (FW) regarding its usefulness as a participatory ergonomics method, using a descriptive evaluation design analysed by phenomenographical approach. The study was conducted among professional cleaners, health care personnel and miners, with a sample of 105 participating subjects in 8 different FWs.*

*Multiple methods, giving a combination of both qualitative and quantitative data, were used for data collection. Good involvement of participants was observed during workshops. Evaluations immediately after FWs and 3 months later showed a strong relationship with high correlation, indicating that the perception of FW participants was very positive. Interviews revealed conformity between developed problem identification and proposed changes. Participants' own perceptions of FW's influence on creativity depict their belief of developed ideas and solutions in order to identify and solve workplace problems.*

*FW is considered to be a useful ergonomics tool, and its qualities are related to structure and practical performance.*

participant involvement problem solving visions and ideas creativity

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## 1. INTRODUCTION

This study attempts to fill the gap between practice and science by scientifically assessing the Future Workshop (FW), a renowned participatory intervention method. Assessment was accomplished at selected workplaces in the northern part of Sweden, among professional cleaners, health care personnel and mining industry personnel, using a qualitative approach. Solutions were developed by involving actors, workshop participants and a workshop leader as a facilitator. FW can be utilised as an ergonomics tool, facilitating employees' participation, resulting in the development of action plans for improvement changes in a workplace.

The FW method is widely used, but present research reveals that it has not been scientifically evaluated. A systematic evaluation of the method would legitimate its practical value and its reliability as a useful ergonomics tool. Researchers and practitioners will benefit from

the results of this investigation, when using this method for investigating ergonomics-related problems and developing intervention solutions for existing problems.

### 1.1. Involvement and Problem Solving

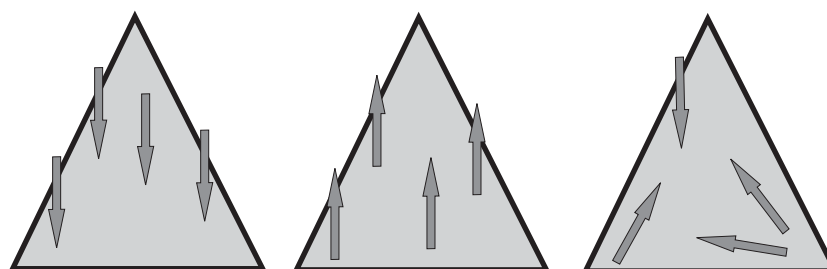
Employees directly involved in the work process are often recognised as being the best actors to make suggestions about improvements in their own work environment. Empowering the workers by counting on their opinions provides them with authority, responsibility and accountability for required decisions [1].

Studies show that broad participation is the most important characteristic of successful change [2]. Karlton [3] described change processes by classifying them in two categories, action driven change and vision driven change. Action driven change occurs within the goals and objectives in the system and it is oriented towards immediate action. Vision driven change is more

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long term, and includes changes not only improving existing systems, but also changing the system and working conditions in the system. Ingelgård [4] stressed that changes cannot be designed with linear perspective in mind, as they usually take unexpected turns and therefore can be characterised as non-linear. Different strategies for ergonomics change are presented in Figure 1.



**Figure 1. Different strategies used for ergonomics change. Arrows indicate from where and in what direction ideas go [4].**

Mikkelsen, Saksvik and Landsbergis [5] found in a Norwegian study on participatory intervention in health care institutions that problem solving, based on the employees' own perceptions of the main problems were the main motivators for organisational change, improvement and increased control.

The closer one is to the workplace, the better one understands the problems. Many workers have suggestions not only on how to improve the quality of work, but also on ergonomics solutions. In Sweden, the Work Environment Law, from 1 July 1991, was changed to expand employer responsibility for workers' conditions [6]. This means that from the employer's point of view, these issues are now dealt with together with other production and quality issues. The main aim is to reach greater involvement from both workers and employers in ergonomics issues at workplaces.

Johansson Hanse and Forsman [7] point out the importance of giving workers opportunities to explain and to identify problems. Eason's [8] statement that only those who are affected by change can decide what is in their best interest

underlines Johansson Hanse and Forsman's opinions. Levi [9] declares, "people know their own problems best and they should be encouraged to speak for themselves" (p. 182). Gardell [10] shares Levi's point of view and argues that obtaining a correct picture of how work influences workers' mental well-being and health is dependent on individuals' own perception of the working conditions. Doukmak

and Huber [11] are of a similar opinion. The ergonomist should be involved as a facilitator [8], helping employees to find the best solutions for their problems.

## 1.2. FW Method

FW is a method developed by Robert Jungk from Germany. The method aims to support participants in identifying common problems, develop visions and ideas, and make an action plan. FW is a structured process divided into five phases: preparation phase, experience phase, fantasy phase, strategy phase and action phase [12]. Participants formulate shared interests and goals, and are actors around shared themes.

It is not necessary for the leader of a FW to have knowledge about the field or problem areas which the FW is focusing on. A strict from-outside perspective can be an advantage, giving the FW a safe and secure framing, where all participants are given space for their ideas and perspectives. Denvall and Salonen [13] describe the leader of a FW as a facilitator, active in the beginning of a change process. Eriksson [14] depicts the group leader or the so-called

workshop foreman as an expert in the process, and not in the actual theme being treated during the FW. Denvall and Salonen [13] as well as Eriksson [14] emphasise the leader’s role in striving for results such as action plans, deeper problem knowledge and shared visions/ideas in/for the group. Robert Jungk [12] states that “the role should be seen, more than anything, as that of a prompter” (p. 50).

FWs consist of five phases. When the theme for the workshop is formulated in close cooperation with people involved, good result depends on good preparation in the **preparatory phase**. The workshop theme must be challenging and distinct. This first phase contains practical tasks such as providing information to workshop participants on the FW and how it will be conducted, time allocated for various phases, facilitators role, place, etc.

**Experience or critique phase** is the opening of the workshop. Problems and irritations regarding the FW theme shall be highlighted. A complete problem catalogue based on the problems presented initially in this phase will be developed.

During the **fantasy or creative phase**, participants are encouraged to forget about all economic, personnel, technical or organisational restrictions. In the fantasy phase everything is possible. Participants create visions and ideas for solving different problems that have been identified in the previous phase. Fantasy solutions are treated realistically in the next phase in order to find practical and applicable solutions.

The aim of the **strategy phase** is to go through all fantasies trying to find the hindering factors. Now critiques and visions are connected into concrete action plans. In this phase participants document clear missions with information about the “who”, “what”, “when” and “how” of reaching the goal, e.g., which action plans should be adopted and what resources are needed for various actions.

**Implementation or action phase** concerns future work in fulfilling concrete missions and

activities that are developed in the strategy phase. It is important to design a timetable for various activities, follow the timetable and to accomplish the shared goals in the action plan.

Denvall and Salonen [13] stress the importance of having enough time when conducting a workshop: the more time, all the better results. In conformity with Jungk and Mullert [12], Denvall and Salonen [13] point out the value of time schemes to be followed during the workshop. If the workshop leader fails in managing to cover the strategy phase during the time available for the session, the result will be frustration and disappointment due to the lack of an action plan. Table 1 presents an example of a time scheme.

**TABLE 1. Time Plan for a 1-, 1.5-, 2- and a 3-day Future Workshop [13]**

Phase	Length (hrs)			
	1	1.5	2	3
Introduction	0.5	1.0	1.1	2.0
Critique	2.0	2.5	3.5	4.5
Fantasy	2.5	3.5	4.5	5.5
Strategy	3.0	5.0	6.5	12.0
Total	8.0	12.0	16.0	24.0

An accomplished FW can be the direct and immediate solution to a problem. Mostly, a FW prepares the foundation for new perspectives, future visions and new ideas for solving problems [14]. The final and most important aim is to make expressed fantasies reality by using participants’ own capabilities and potentials, considering the available resources.

## 2. AIM

The aim of this study was to determine (a) perceived apprehensions of the FW method among participants, (b) immediate or long-term actions as a result of a FW among the participants, and to evaluate the scientific value of the FW assessing its usefulness as an ergonomics tool for improvement.

### 3. PARTICIPANTS AND METHODS

This study had an evaluation research design, measuring the effectiveness of a method, in this case the FW. This research was contemporaneous. Descriptive evaluation was carried out using Øvretveit's [15] Type 1 design.

#### 3.1. Participants

Eighty-one employees in three selected workplaces participated in workshops and filled in evaluation questionnaires immediately after the workshops and 3 months later. Twenty-three cleaners (28.4%), 36 health care personnel (44.4%) and 22 miners (27.2%) participated in the workshop. The mean age of the participants was 39 years among cleaners, 44 years among health care staff, and 47 years among mining personnel. Mean length of work-experience was 14 years among cleaners, 18 years among health care staff, and 20 years among mining personnel. Eight foremen/forewomen in the selected workplaces were interviewed and filled in a questionnaire with a visual analogue (VAS) scale 3 months after the workshop. Sixteen co-workers of workshop participants (2 in each workplace) were interviewed and filled in a VAS scale 3 months after the workshop.

#### 3.2. Workshops

FWs were conducted in selected workplaces among cleaners, health care personnel and miners with 5–20 participants per session from each workplace. In this study, the workshops lasted approximately 4 hrs, which was a modification in terms of limiting the time used. The modification used in the present research project is an issue for comparison and discussion with Jungk and Mullert's [12] or Denvall and Salonen's [13] time schemes.

#### 3.3. Participant Observations and Interviews

Observations were made during all workshop sessions, and documentation was made through

field notes and memos in connection with each session. The field notes were written down on two levels as described by Potter [16]: the first one was a surface level, on the spot, illustrating what was observed. The other level consisted of comments written afterwards and speculations about the events. Qualitative data was analysed with the phenomenographical approach searching structure, characteristics, patterns and themes in material such as field notes, memos and interviews. This analysis was done in order to give a description on the process [17]. Important patterns and themes were identified and considered in the analysis of observations during the workshops, and in the interviews.

#### 3.4. Questionnaire

A questionnaire method was used for assessing participants' immediate perception of the FW. The questionnaire had 12 items on a 5-point Likert scale. Participants scored by assigning weights to response alternatives, from 5—*strongly agree* to 0—*strongly disagree*.

#### 3.5. Workshop Protocol

A report/protocol, as suggested by Eriksson [14], was written after each workshop and submitted to all participants and the manager of the workplace. It consisted of a brief description of the FW method, the formulated theme, the phases carried out during the session, including a problem catalogue, fantasy solutions and an action plan.

#### 3.6. Participant Evaluation

Evaluation of participant's experiences from the FW was made 3 months after each FW with a questionnaire with 12 items on a 5-point Likert scale and an open question for participant's own comments. This evaluation sheet was similar to the one filled in by participants directly after the FW. The results of the questionnaires filled in directly after the FW and the other one filled in 3 months later were compared.

**3.7. Co-Worker Evaluation and Foreman/Forewoman Evaluation**

Evaluation among co-workers, not participating in the workshop, and foremen/forewomen was accomplished. A focused semi-structured interview and filling in a 100-mm VAS scale on two items were performed 3 months after each FW. A VAS scale was used to minimise the boxing effect and central tendency in respondents filling in their apprehensions regarding outcomes from the FW.

**3.8. Quantitative and Qualitative Methods**

As described, this study used more than one method. The researcher’s own perceptions as a workshop leader together with documented survey, observations, a questionnaire study with ordinal scales, and interviews combined with VAS scales formed a basis for multiple methods, using both qualitative and quantitative data. According to Åborg [18], a researcher can benefit from a combination of the two approaches. Table 2 illustrates the methods used in this study.

**TABLE 2. Qualitative and Quantitative Methods Used**

Method	Data Collection		
	Related to FW	Directly After FW	3 Months After FW
Observations related to FW	N = 81		
Questionnaires		N = 81	N = 72
Interviews with foreman/forewomen			N = 8
Interviews with co-workers			N = 16

Notes. FW—Future Workshop.

**3.9. Statistical Methods Used**

A paired Student’s *t* test was used for comparing the means of attitudes ranked in questionnaires immediately after and 3 months after the FW. Pearson’s correlation was used to examine relationships between responses in questionnaires directly after and 3 months after the FW. A *p* value of <.01 was used to test statistical significance.

**4. RESULTS**

**4.1. Participant Observation, Memos and Protocols**

The phenomenographical approach analysis produced results regarding patterns and themes in the eight workshops. Patterns and themes are connected into features such as interest of theme, involvement during session, permission to fantasy, focus on reality/action, and use of time. High degree of involvement was denoted during all eight workshops, and in seven of the workshops the participants permitted themselves to fantasies, which in the following phases of the workshop were converted into reality and action.

**4.2. Questionnaire One, Directly After FW**

Eighty-one participants answered the 12 items immediately after workshop. Using a 5-point Likert rating scale they gave their perceptions regarding the usefulness of the FW in problem identification and solutions, perceived ease of understanding instructions, perceived ease of participating in the process and perceived effect

on creativity and action. The scale was scored by assigning weights for response alternatives from 5—*strongly agree* to 0—*strongly disagree*. An overall rating (mean value) of 4.16 was obtained.

**4.3. Questionnaire Two, 3 Months After FW**

Seventy-two participants (89%) answered the questionnaire with 12 items 3 months after each



workshop. Nine of the subjects were missing at the 3-month evaluation. This was due to retirement (1 subject), leaving the workplace and starting a new job (3 subjects), sick leave (4 subjects), and no known reason (1 subject). An overall rating (mean value) of 3.82 was obtained.

#### 4.4. Summary of Questionnaires

All participants filled in evaluation questionnaires directly after the FW, and 89% did so 3 months later. Participant's rated highly their perceptions about the usefulness of FWs in problem identification and problem solving (mean value above 4 on the 5-point scale).

#### 4.5. Statistical Tests

Results from a paired Student's *t* test, comparing means of attitudes, indicated conformity between evaluations directly and 3 months after the FW ( $t = 7.28$ ,  $df = 11$ , 2-tailed probability of .000,  $p < .001$ ). When using Pearson's correlation, significance was denoted between results from questionnaire directly after and 3 months after the FW. Coefficient values were close to one (.948\*\*), which means a strong relationship.

A scatter diagram (Figure 2) illustrates the positive relationship between the results from the evaluation questionnaire directly after and 3 months after the FW.

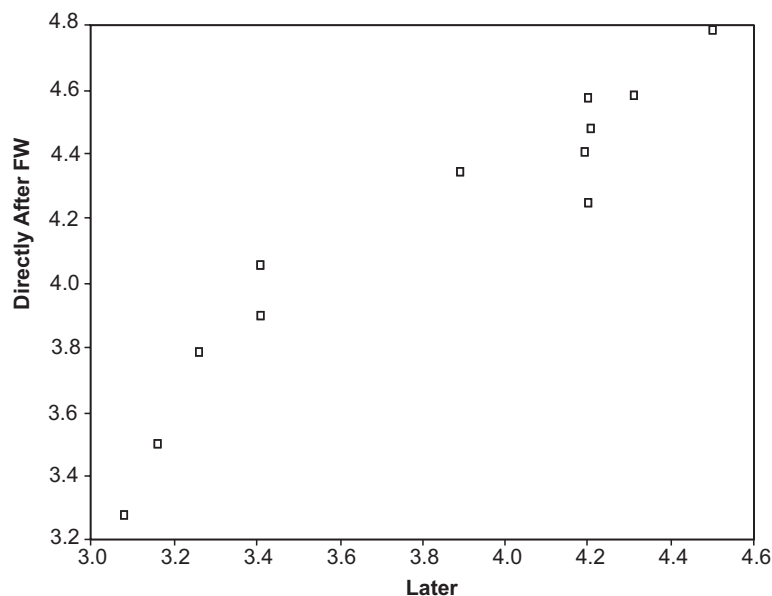


Figure 2. Positive relationship between questionnaires. Notes. FW—Future Workshop.

A slight decrease in problem solution was observed in the 3-month evaluation. Ease of understanding instructions was rated above 4, nearly 5, in both evaluations. Ease of participation was rated above 4 on both occasions. Time spent in the workshop was rated 3.79 directly after the FW, and 3.26 three months later. This result, combined with own written comments regarding limited time, indicated a need for more time to be allocated for the workshop.

#### 4.6. Interviews

In all workplaces, FW participants developed action plans for carrying out the proposed improvements changes. With regards to short-term actions, one foreman stated that 30% of the proposed actions were carried out after 3 months. Another 5 foremen/forewomen from other workplaces indicated that 50–60% of the planned short-term actions were carried out. Two foreman/forewoman stated that up to 75% of short term improvement changes were

completed. According to all eight (100%) foremen/women, long-term actions were planned and commenced at all workplaces, at a rate of 50–80%. Since some of the long-term actions were change processes during a period of time they were not all completed.

Conformity was recognised between developed problem identification and proposed changes, and interviewees’ own perspective (Figures 3 and 4). Accordance was high, since co-workers as well as foremen/women marked 50 or more on the VAS scale.

One foreman gave this comment: “The workshop was good for the workers. Now they have spoken out about some problems and suggested solutions, and started using the written material as a base. And some solutions were really simple, and easy to effectuate” [19] (p. 39).

5. DISCUSSION

The response rate for the 3-month evaluation was 89% (72 of the 81 participants of FWs). This is a

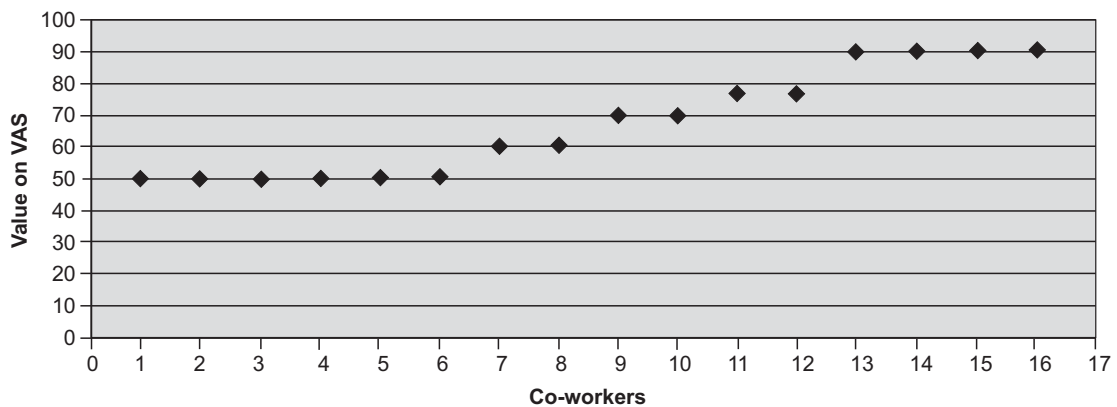


Figure 3. Co-workers’ perception about correspondence between problem catalogue/proposed changes and own perspective (n = 16). Notes. VAS—visual analogue scale.

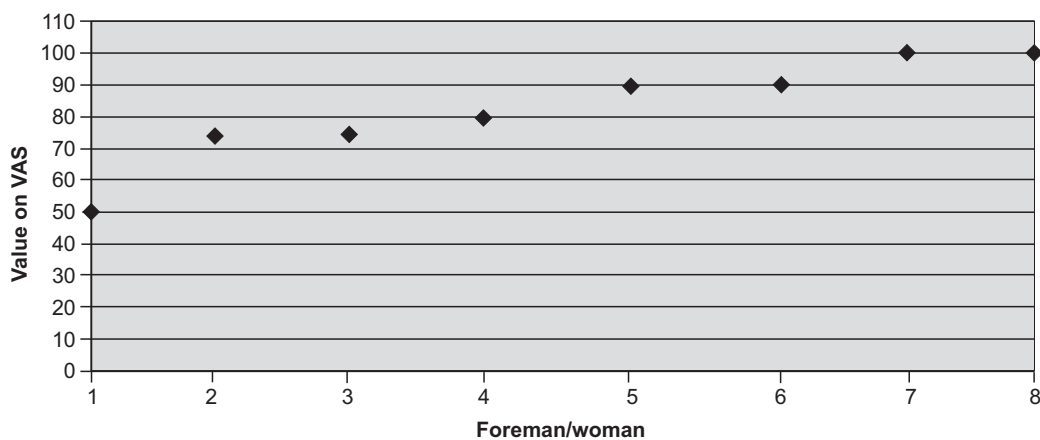


Figure 4. Foremen/forewomen’s perceived correspondence between developed problem catalogue/proposed changes and general picture of workplace (n = 8). Notes. VAS—visual analogue scale.

high response rate, which illustrates involvement and interest of FW participants in giving feedback.

### 5.1. Time Table and Group Size

The length of sessions is a very important and critical issue. Already in the planning stage of a FW, the workshop leader has to consider the importance of the time factor. He/she has to have in mind the particular conditions of the workplace, the number of employees involved, specific problem areas, etc. With the basic information on hand, the leader has to make a judgement on session length, combined with suitable location and arrangements for the workshop. Discussion with and co-operation of management throughout the process is fundamental, starting with planning and ending with the final report from the workshop.

A small group, only 5 participants in the smallest group in this study, has shown to be positive and creative. In many smaller or medium-sized workplaces there are small groups of employees building up specific workplace groups with shared specific goals. The FW method adapted to a specific group or workplace of 5–20 people can create excellent solutions to practical, technical, or organisational problems concerning the group. These solutions can be cost effective for both the workplace and the organisation, as well as psychologically important to employees' work satisfaction and well-being. In this study, the results from the participating actors support the use of FW as a method in assessing ergonomics problems and developing solutions among small workgroups as well as larger ones.

### 5.2. Structure of FW

From the results of the questionnaires, it is evident that the concept can be used for specific groups regarding size, length, and themes. However, the role of the leader or workshop foreman/woman is crucial. It is important to have methodological knowledge and a basic foundation consisting of well-structured phases and the specific procedure of FWs.

Structure means strength and solidity of the methodology used. The leader knows what to do, and has a concept to follow. With this follows a readiness to meet demands and questions raised in the group during the sessions. Providing the participants with a report/protocol is important as an idea catalogue and feedback for participants in the workshop.

Dialogue is placed in centre of the activity performed in the group. Perspectives of "before-present-future" are used. Action and involvement are emphasised [13]. An external leader has a role of a facilitator in the process, using a from-out side perspective. A process characterised as non-linear [4] has to take place during the workshop sessions.

The success of a workshop cannot be measured only in terms of problem catalogues or proposals. In conformity with Jungk and Mullert [12], the criteria for success have to be "how the workshop subsequently affects participants' minds and behaviour" (p. 72).

### 5.3. The Role of an Ergonomist as a Facilitator

An external leader, with a from-outside perspective, is a strength [13]. Not having connections to the workplace can be an advantage of a workshop leader as a facilitator in the beginning of a process. The main concern is the goal of developing action plans based on shared visions and ideas for the future.

After closing a FW session there is need for a follow-up. Researchers like Eriksson [14] point out the difficulties in keeping long-term processes alive. There have to be some people who are engaged and interested in further actions on site. Otherwise long-term action plans are bound to fail. Involvement of an ergonomist as facilitator can create good participative environment, aiding the involvement of actors in finding feasible and practical solutions [8].

An ergonomist can facilitate future processes based on the workshops that had taken place, connecting earlier problem catalogues and action



plans into current up-to-date conditions, by follow-up workshops. FW can be used in the beginning of change processes: in terms of action driven change or vision driven change described by Karlton [3]. FW can also be used in on-going development processes with one workshop followed by other workshops for a period of time. Jungk and Mullert [20] use the name “permanent workshops” for this concept of working towards shared future visions.

#### 5.4 Reflections Regarding FW Methodology

FW is a useful and practicable tool in participatory ergonomics. Preconditions for conducting successful FWs are as follows:

- Skilled workshop leader with knowledge of the method;
- Structure in conducting the workshop;
- Enough time to work through all phases, giving participants time for own reflections;
- Co-operation and communication with the manager, starting with planning and ending with a report/documentation.

Using appropriate tools at an appropriate time and space encourages activity among involved actors. An activity process starts and participation is nourished through active involvement within the group. The model of utilising permanent workshops can help workplaces to keep the process alive. FW as a vital tool enables short-term as well as long-term actions for improvement changes at workplaces. Themes can be formulated according to existing needs, such as practical problems, environmental problems, psychosocial issues, safety issues and risk analysis.

In conclusion, based on the results of this study, the FW method can be recommended as an ergonomics tool. FW promotes employees' participation and is a feasible and useful method, whose qualities are related to its structure and practical performance.

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