

# A Proposal of Efficient Agile Implementation Process Model to Enterprise Organization by Involving Indirect Departments

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## ABSTRACT

In recent years, agile, which originated in the world of software development, has begun to be widely deployed as a means of organizational transformation, incorporating its concepts not only into software development but also into management. On the other hand, the actual implementation of digital transformation and agile requires considerable effort, cost, and time, due to a wide range of factors such as reviewing the organizational structure and internal governance to change the corporate culture and stereotypes and reviewing the way personnel evaluation is conducted. However, at present, without understanding the essence of agile, there are many cases where people simply introduce a framework or apply part of the framework and proceed in their own way, which does not lead to any business results. Therefore, we propose a new process framework that shows how to involve the indirect departments in introducing Agile into an organization. The organization in charge of agile implementation in a company can use this framework to penetrate agile into the organization step by step. We interviewed experts in agile implementation and concluded that the proposed is effective under certain conditions.

Keywords: Enterprise Agile, Framework, Indirect Departments, Scrum.

## 1. INTRODUCTION

In recent years, “Agile”, which originated in the world of software development, has begun to be widely deployed not only in software development but also in management as a means of organizational transformation. According to Digital.ai’s 2021 survey (Digital. ai, 2021)96% of the companies that responded to the global online survey have adopted Agile. The survey found that 96% of the companies that responded had adopted Agile, and of those, 52% had more than half of their teams applying some Agile practices. This indicates that agile is not limited to a few countries or industries but has become a major trend around the world.

As for the trend of Agile adoption by Japanese companies, according to a survey conducted by the PMI Japan Chapter in 2021 (PMI Japan, 2021)39% of companies answered that they have already adopted Agile. Compared to the aforementioned figure of 96% for global companies (Digital. ai, 2021)situation where adoption is considerably delayed.

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In the age of VUCA (Volatility, Uncertainty, Complexity, Ambiguity), the introduction of “Agile” has become essential for Japanese companies to speed up and strongly promote digital transformation and escape the “lost 30 years” of stagnation.

According to the aforementioned Digital.ai's 2021 survey (Digital. ai, 2021) 18% of companies use Agile not only in their IT departments but also in all of their internal teams, and 34% of companies use Agile in more than half of their teams. While software development is the most common area of application, there is a wide range of other areas such as marketing, human resources, and sales. As a result, frameworks for applying Agile not only to one team, but also to multiple teams and entire organizations have been created.

On the other hand, when actually implementing digital transformation and agile, changing the corporate culture and changing stereotypes requires considerable effort, cost, and time, including reviewing the organizational structure, internal governance, and personnel evaluation. However, without understanding the essence of agile, there are many cases where companies have simply introduced a framework or have applied a part of the framework in their own way, which has not led to any business results. In addition, many companies that are reviewing their organizational structures and internal processes under the banner of agile transformation are confused because they have no experience in this area and do not know how to proceed or what they need to review in their existing governance and operations. (Srinivasan and Lundqvist, 2009, p. 1413)

## 2. DEFINITION OF ENTERPRISE AGILE

The term “agile” was defined in 2001 when Kent Beck and 17 others gathered to create the “Manifest for Agile Software Development” (Beck *et al.*, 2001). The book was compiled by a group of 17 people who were researching advanced software development methods at the time, and it describes the key concepts in software development. In other words, Agile is not a methodology, but a definition of thinking. In this paper, We use the term agile based on this definition.

In addition, the definition of enterprise agile in this paper is “agile applied to an organization, and the scope of application includes application to the entire organization, not just IT”.

### 3. PREVIOUS RESEARCH

In this chapter, we describe the main frameworks in agile development, their characteristics, and show the challenges they have.

#### 3.1 Agile Frameworks

##### 3.1.1. Scrum

Currently, the most adopted framework in Agile is Scrum. 81% of companies use Scrum (66% use Scrum Only and 15% use it with other methods) (Digital. ai, 2021). This was invented by Jeff Sutherland and his colleagues in the 1990s, based on a 1986 paper by Hirotaka Takeuchi, a professor at Harvard Business School, and Ikujiro Nonaka, a professor emeritus at Hitotsubashi University, entitled “The New New Product Development Game”(Takeuchi and Nonaka, 1986). It also incorporates the ideas of the Toyota Production System by Taiichi Ohno(Ohno and Bodek, 1988) and the OODA Loop proposed by Colonel John Boyd of the U.S. Air Force(Angerman, 2004).Scrum has become a simple framework for working in teams, with three roles, five events, and three creations defined. The Scrum Guide 2020 (Ken Schwaber 2020) defines it as follows

“Scrum is a lightweight framework that helps people, teams and organizations generate value through adaptive solutions for complex problems.”

The simplicity of Scrum makes it a framework that can be applied to various fields other than software development.

##### 3.1.2. Kanban

“Kanban” (Schonberger, 1982) is a method of visualizing and incrementing the flow of work using Kanban by starting with the highest priority tasks while limiting the number of work-in-progress (WIP).

##### 3.1.3. Extreme Programming (XP)

“Extreme Programming (XP)” (Beck, 2000) characterized for software development to improve software quality and responsiveness to changing customer requirements. XP defines five values (communication, simplicity, feedback, courage, and respect) and 19 practices in four categories to achieve them.

#### 3.2 Scaled Frameworks

As Agile is increasingly being introduced at scale to the entire organization, rather than just to a single team, frameworks have been devised for adaptation to multiple teams and the organization as a whole. The four main frameworks are as follows.

##### 3.2.1. Scrum@Scale

“Scrum@Scale” (Scrum Inc., 2019)is a framework for systematically scaling Scrum in a fractal hierarchy, invented by Jeff Sutherland. It aims to transform the entire organization into a Scrum-

based organization, so that the entire company can be transformed into a quick decision-making, customer-oriented organization, and bring superior products and services to market.

### **3.2.2. Spotify Model**

The “Spotify model” (Kniberg and Ivarsson, 2012) is a organizational form adopted by Spotify and applied by ING Bank and others.

### **3.2.3. SAFe (Scaled Agile Framework)**

“SAFe (Scaled Agile Framework)” (Leffingwell, 2018), proposed by Dean Leffingwell, is a framework for implementing Agile on a corporate or divisional scale, and is easily applicable to hierarchical organizational structures. It is easy to apply to hierarchical organizational structures. The scope of application is broad, including portfolio management, organizations and teams, culture and leadership.

### **3.2.4. LeSS (Large-Scale Agile)**

“LeSS (Large-Scale Agile)” (Turner *et al.*, 2013) is a framework invented by Craig Larman and Bas Vodde. It is a simple framework that takes the principles, rules, and elements of Scrum and scales them up to apply to multiple teams. Therefore, it is suitable for expansion from a single team rather than an entire organization.

## **3.3 Relationship between psychological safety and agile**

In addition, reducing interpersonal risk is considered important in applying agile, and psychological safety has been studied in agile development.(Lenberg and Feldt, 2018). “Psychological safety” (Edmondson and Lei, 2014) concept created by Harvard professor Amy C. Edmondson and defined as “the shared belief among team members that it is safe to take interpersonal risks in a team”. The term was first introduced to the world in 2015(Google, 2015) when Google announced it as an element of a truly efficient and successful team. Agile aims for high performance teams, and of course, Agile is applied at Google. One of the five value criteria of Scrum is Respect. Respecting each other and trusting each other to communicate leads to team productivity as well as increased member engagement. Therefore, it is extremely important for Agile to ensure psychological safety.

## **4. ISSUE**

We did not focus on agile values, concepts, one team framework, and scale framework, which have already been studied, but focused on the process of introducing agile into the organization, the roles and functions of the indirect departments, and the implementation details in the introduction process in this proposal.

In a 2021 survey conducted by Digital.ai (Digital. ai, 2021) the most significant barriers to adopting and scaling agile practices in organizations were described as “inconsistent processes and practices across teams” and “insufficient management support and sponsorship”.

In addition, although prior research has studied the values of agile and the framework of teams and organizations, there is no research that specifically and clearly shows how to involve indirect departments in introducing agile into an organization, as shown in Table 4-1.

**Table 4-1 Summary of the relationship between previous studies and the proposal**

	Agile Frameworks	Scaled Frameworks	Proposal
Agile values and concepts	✓	✓	-
Framework for one team	✓		-
Scale Framework		✓	-
The process of introducing Agile into an organization		✓ *Defined in some frameworks	✓
Roles and functions of the indirect department, and implementation details for each process			✓

Agile Frameworks (Scrum,Kanban,Extreme Programming)

Scaled Frameworks (Scrum@Scale,Spotify Model,SAFe,Less)

As a novelty of this proposal, we have developed a process model for implementing Agile for the case where Agile is introduced to the entire company organization or multiple business units, and defined the functions required of the indirect departments and how the indirect departments are involved in each phase of the implementation process. Although there have been frameworks for scaling and a summary of the main processes related to the introduction of agile into an organization, none of them have gone into the functions of the indirect departments. Reviewing the internal governance is essential for introducing agile into an organization, and this proposal will help to improve the success rate. The following chapters present the proposal in detail.

## 5. PROPOSAL

In this chapter, we describe the concepts and functions of our proposal, and then present the process model.

### 5.1 Importance of the Agile Implementation Process Model

In order to introduce Agile into an organization, it is not enough to simply introduce a framework. First of all, it is necessary to change from the traditional plan-driven thinking to the values and ways of thinking as described in the Agile Manifesto. In addition, it is not just a matter of introducing a framework, but also a matter of redefining organizational structure and roles to support new ways of working and values, reviewing internal governance such as budget management, and changing human resource development and personnel evaluation systems. In order to achieve this, the first important thing is to exercise leadership. It is necessary for top management to have a deep understanding of the significance of change and to be prepared to

lead despite the investment and pain involved. In this proposal, we propose a process model for efficient use of the framework.

## **5.2 Functions an organization should have in an agile implementation**

This section describes the important functions that organizations should have in an agile implementation, as proposed in this proposal.

### **5.2.1. Function of coaching**

When introducing Agile into an organization, coaching is important for the team to self-organize and change the mindset of individual members. Learning the framework of scrum and scale is not enough for an organization to function. It is necessary to understand the purpose of each event and to constantly keep kaizen going. It is necessary to change the conventional values such as the plan-driven thinking and unspoken rules within the company that have been ingrained for many years, but in many cases, internal members alone do not realize what needs to be changed. Therefore, bringing in an external coach to make them realize that what is normal is not normal will lead to changing the organizational culture. External coaches provide Scrum implementation training and coaching for each team to educate them on the three roles in the Scrum framework (Product Owner, Scrum Master, and Developer) and support them in revising internal governance in the indirect departments.

### **5.2.2. Function to revise internal governance**

In order to make an agile organization work, it is necessary to review internal governance, review internal operations to increase the value of agile as an organization as a whole, and build a mechanism to support new ways of working in each department. The main changes are listed below.

#### **(Business Plan)**

With the conventional plan-driven approach of one year, it is necessary to make decisions quickly based on the situation and data collected, because society is changing quickly and competition is fierce. For example, it is necessary to speed up the cycle by reviewing the strategy every quarter to determine where and how to allocate resources (resources and costs).

#### **(Budget Management)**

With the aforementioned change in the business planning cycle, the budget management operation also needs to be reviewed. Allocating budgets after planning the scope, release date, and resources as in conventional projects is likely to result in wasted investments. The key point is how to reduce unnecessary investment and derive business results. In product development, the finance department needs to support the development team to synchronize and allocate the budget at the right time.

#### **(Human Resource Development)**

As new roles, Scrum defines Product Owner, Scrum Master, and Developer. It is necessary to define the job authority and required skills for each role, make a development plan, and promote human resource development and hiring. The roles of management and middle management

will also change. The roles of management and middle management will also change. They need to be trained to adopt a servant leadership style of management.

#### (Personnel Evaluation System)

Traditional HR evaluation systems are not suitable for agile organizations. In Agile, it is important for teams to self-organize and improve team performance. It is necessary to build a system that encourages the improvement of team performance by switching to team evaluation instead of individual evaluation, or by adding the degree of contribution to the team or organization to the evaluation items.

#### (Legal)

In most cases, software development in Japanese companies is outsourced to IT vendors and development is often ordered under contract. The IPA (Information Technology Promotion Agency) and IPSJ (the Information Processing Society of Japan) have each presented model contracts for agile systems, so it is recommended to conclude them with reference to these. (IPA, 2020) (IPSJ, 2020)

#### (Quality Control)

The conventional approach to quality control in system development is based on the waterfall model. The concept of metrics evaluation is also based on the review and testing process used in waterfall. In the case of agile, the testing process itself changes in order to repeat analysis, design, implementation, and testing in a short period of time such as one to two weeks. In addition, automation of testing and deployment is a must. It is necessary to understand the differences from the past and redefine how quality control will be involved in the new quality process.

#### (Comfortable Work Environment)

Creating an environment where teams can easily work and communicate with each other will not only affect the productivity of the team, but also the speed of work for the entire organization and the speed of decision making by management. It is necessary to create an environment that facilitates the generation of ideas and concepts by reviewing the working space and preparing facilities such as whiteboards. For remote work, support such as online tools should be provided.

### **5.2.3. Function to lead agile implementation.**

In order to promote agile implementation, a new agile implementation promotion team will be established to lead this. One of the cases where organizational agile implementation has failed is when it is left to external companies such as consulting firms. Reforming an organization will not be successful without the strong involvement and leadership of internal members who understand the company's culture, organizational characteristics, and the characteristics of individual employees. In addition, it is recommended to include an external coach who is an expert in the Agile implementation promotion team to support the planning of Agile implementation, conduct implementation training, and coach the team.

#### **5.2.4. Function to encourage learning and growth in organization**

In order to improve the performance of the entire organization, it is effective to establish “internal community activities” as a place to share good patterns of success across the organization and to promote the resolution of problems in work changes. This is a kind of in-house study group activity held by volunteers. Incorporating community activities that allow you to build a horizontal network while having fun in a casual manner will lead to information sharing and collaboration between organizations, and will revitalize the entire organization. Spotify, which is a successful agile organization, has a system called guilds (Kniberg and Ivarsson, 2012). guild is not a formal organization, but a place where volunteers can work together to form an internal community. By joining a guild that interests them, employees are provided with opportunities to learn and grow, which leads to increased engagement.

### **5.3 Agile Implementation Process Model**

In order to introduce Agile into an organization, we have defined a model of the process from start-up to deployment to the organization. The overall picture is shown in Figure 4- 1. The RACI chart is a way to clarify who is responsible for the work and the scope of responsibility, and the four roles are as follows. (Project Management Institute, 2013)

- **R = Responsible (also recommender)**  
Those who do the work to complete the task. There is at least one role with a participation type of responsible, although others can be delegated to assist in the work required.
- **A = Accountable (also approver or final approving authority)**  
The one ultimately answerable for the correct and thorough completion of the deliverable or task, the one who ensures the prerequisites of the task are met and who delegates the work to those responsible. In other words, an accountable must sign off (approve) work that responsible provides. There must be only one accountable specified for each task or deliverable.
- **C = Consulted (sometimes consultant or counsel)**  
Those whose opinions are sought, typically subject-matter experts; and with whom there is two-way communication.
- **I = Informed (also informee)**  
Those who are kept up-to-date on progress, often only on completion of the task or deliverable; and with whom there is just one-way communication.



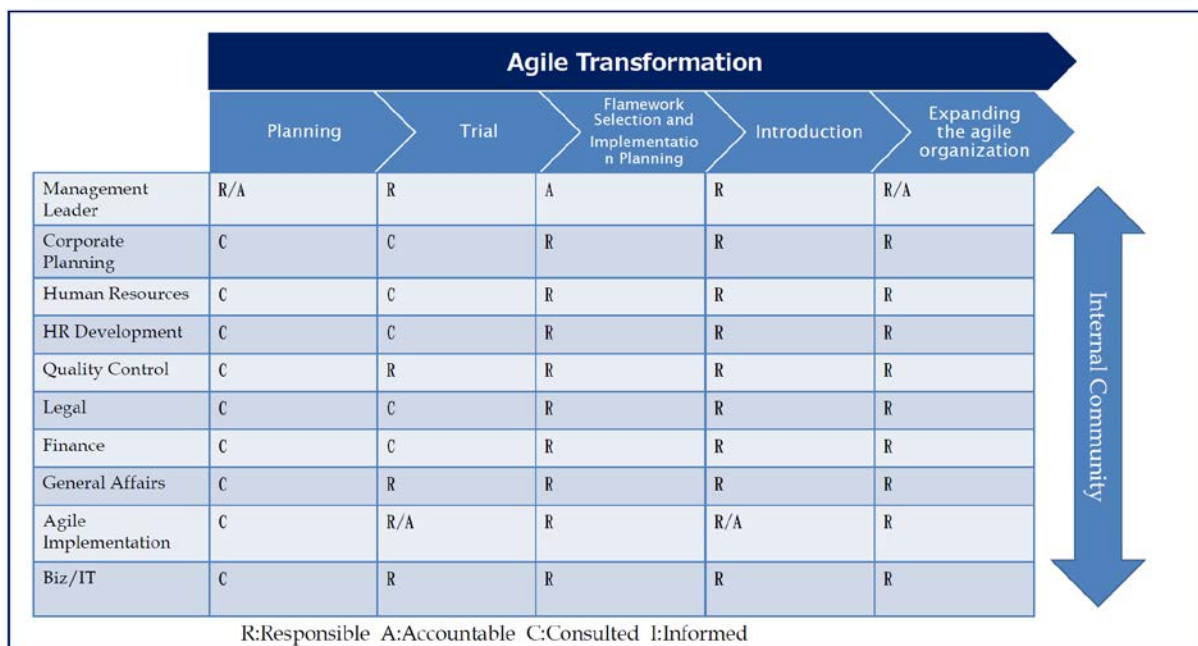


Figure 4- 1 Agile Deployment Process Model

In addition, the internal community is a place for in-house study group activities conducted by volunteers.

The following is a description of each step and key points for implementation.

### 5.3.1. Planning

(Description)

Conduct overall planning to promote agile transformation. Establish a new team to promote agile implementation, and work with management to establish overall plans, milestones, and budget plans. In addition, we will select a department to be introduced first as a trial.

(Role of the department)

- In a company-wide organizational reform, top management must first take the lead in decision-making.
- Establish an agile implementation promotion team and appoint a leader.
- Each relevant department will participate in the planning stage to establish the purpose and future plans.
- Select a department for the trial and establish a trial plan with the department.

### 5.3.2. Trial

(Description)

Conduct a trial with two or three teams, preferably on a small scale, in the department that will implement the system first. Provide Scrum training and implement the trial for 6 to 9 months. As in the Tuckman model of team formation, once the confusion phase is over and the results begin to emerge during the unification phase and functional phase, the team will be able to

essentially embody Agile. In the trial, it is desirable for the coach to support the team formation with support.

(Role of the department)

- The agile implementation promotion team will support the department in the trial.
- General Affairs provides support for facilities (e.g., making the workplace more communicative, installing whiteboards).
- The quality control team will review how processes and testing differ from those used in the past for product and service development, learn how to improve quality in agile, and review internal rules.
- Other indirect departments will observe the team to understand the agile organization, the company's policy for revising the rules, and the support needed by each organization.

### **5.3.3. Framework Selection and Implementation Planning**

(Description)

Redefine the organizational structure, roles, and duties and privileges that suit your business, based on what you learned about team management, agile work methods and their effects, and challenges in implementation during the trial. It is recommended to select a scale framework from existing proven frameworks (Scrum@Scale, Spotify model, etc.) rather than building one on your own. In addition, each department should select a framework from Scrum, Kanban, etc. according to its business characteristics.

(Role of the department)

- Corporate Planning consults with the Agile Implementation Promotion Team, HR, and the trial implementation department.
- Determine the scale framework and define the new roles and mandates.
- The agile implementation team will determine the implementation training, implementation plan for each organization, and support plan.
- Each indirect department considers the items to be revised and the direction of internal rules and organizational operations from the perspective of the function of revising internal governance as described in 5.2.2. .

### **5.3.4. Introduction**

(Description)

The first step in introducing Agile to the entire organization is for top management to explain to all employees what the company is trying to achieve. The most difficult part of Agile is to change the organizational culture, but it is necessary to overcome this difficulty. For this reason, it is important to send out a strong message from the top management. In this phase, we will mainly explain the significance of the new organizational structure, the new roles and responsibilities, and the policy for reviewing internal rules accordingly, and provide Scrum training to all employees. Since employees may feel uneasy about a major organizational change, information disclosure and dialogue should be conducted.

(Role of the department)

- Management leaders communicate the company's vision and commitment to all employees.

- Announce how each indirect department plans to change its organizational structure and internal rules.
- Training will be provided by the Agile Implementation Promotion Team.
- Disclose information and make announcements through internal PR.

### 5.3.5. Expanding the agile organization

(Description)

Deploying agile in multiple organizations. Since teams may be confused about how exactly to change their work process when they actually start, it is necessary for the agile implementation promotion team to support them in the start-up phase. It is desirable to increase the number of teams applying Agile in stages, considering the capacity of the Agile implementation promotion team to support them.

In order to evaluate the degree of penetration into the organization, We propose that it would be effective to adopt the framework for deriving performance indicators for evaluating organizational change (Miura, Kobayashi and Shirasaka, 2020).

(Role of the department)

- Support for each department by the agile implementation promotion team
- Establishment of internal community by agile adoption promotion team
- Each indirect department reviews its internal rules and operations from the perspective of its function to revise internal governance as described in 5.2.2.
- Management leaders should regularly send out resolutions and messages to employees to educate them.

## 6. EVALUATION

### 6.1 Evaluation and Discussion by Experts

In order to confirm the validity of this proposal, we asked written questions to eleven coaches who are leading the promotion of agile implementation in their organizations or are experts in supporting agile implementation, and received responses from three of them. All of them shared the same understanding of the issues and evaluated our proposal as reasonable.

One of the expert coaches who supports agile implementation suggested that in addition to our proposal, there are also issues in the following two points. In the case of system development, many companies have project risks checked by internal third parties, but as teams become self-organized, risk management will be done by the teams themselves. The traditional role of risk management by third parties needs to be reviewed, and the status of each team needs to be visualized to increase transparency. If there are tasks that have been outsourced, it is necessary to review the relationship with the outsourced company and synchronize the work with the members of the outsourced company. This case is more complicated than the case where a company alone introduces Agile. Software development in Japanese companies is often outsourced to external vendors, and this is an issue for the future.

The other expert coach who supports agile implementation also responded that the issues are appropriate. He mentioned that there are cases where only partial adoption of agile within the

organization has progressed, and it has not led to a transformation of the entire organization, and there are cases where the management does not understand the value and effectiveness of agile, and the organizational deployment has not progressed. He also answered that the support of external coaches mentioned in the proposal would help solve this problem and spread the correct understanding of Agile.

We also received the following comments from the person who is leading the promotion to deploy Agile in their organizations, “As IT is the core of the business, IT agility will be a competitive advantage. To achieve this, it is necessary to review conventional indicators. For example, by looking at lead time and deployment frequency as indicators of development speed, we can see whether the hypothesis testing process is being carried out quickly. As for quality indicators, we can look at average repair time and change failure rate to see if we are repairing quickly. Therefore, when organizations adopt Agile, they need to review their quality metrics, etc., and this proposal is reasonable.”

The following issues emerged from the interview results.

- As teams become more self-organized, they will be able to manage risks on their own, and it is necessary to consider rethinking the role of traditional third-party risk management.
- In cases where work is outsourced to an external contractor, in order to increase business agility, it is necessary to review the type of contract, the role of the contractor, or to review the scope of work to be outsourced in the first place. In the case of outsourcing, it is necessary to consider the means to build a relationship where both parties can collaborate smoothly after the introduction of Agile.

By applying this research to the actual implementation of Agile in an organization, new issues will be discovered and the functions and governance to be reviewed in each department will become more concrete, so it is necessary to further brush up the contents of this research including the results of the trial.

## **6.2 Future Plans and Initiatives**

We conducted the validity evaluation in the form of interviews with experienced people, such as those who are actually leading the promotion to deploy Agile in the organization and expert coaches who are supporting Agile implementation. In the future, we will apply this process to companies that are actually introducing agile into their organizations and conduct validity evaluations to verify the correctness of the process and to identify areas for further improvement.

## **7. CONCLUSION**

We defined the process of implementing agile throughout an organization, what functions each department, especially the indirect departments, needs to perform, and what to do in each phase of the implementation process. We also conducted an evaluation by interviewing those who are leading the promotion to deploy agile in the organization and expert coaches who are supporting the agile implementation, which suggests that this proposal is effective for organizations that meet certain prerequisites.

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