**Agile project management with Scrum: the preference of the success model.**

# Abstract

Agile project management becoming increasingly important in recent year, understanding of the preference of the success model can benefit people who using this kind of management approach and enhance their chances of success. This investigation was performed to giving a comprehensive result of what is the successful agile project management with Scrum preference. The researcher released a questionnaire survey to people who has experiences of agile project management with Scrum to comprehend the elements of success model. The dietary data suggests that the preference success model has relationship with the project content and project team members. What is more, a 10 reranking agile project with Scrum failure factors supports the model as well. A possible association has been suggested the project content including project industry background, company’s development stage and product consumer has relevant connect with the success model, and leadership is crucial in it which may influence the project results. The most common failure factor is Inefficient Communication, which can help people be successful indirectly.

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# Introduction (550)

# Literature review

1. **The agile approach and Scrum.**

The agile approach to systems development was formalized in 2001’s “Agile Manifesto” (Beck et al., 2001 ; Fowler and Highsmith, 2001).**(ref 1)**. 12 agile principles which defined the agile approach were articulated in the Manifesto by 17 software professionals. They are:

* + Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
  + Welcome changing requirements, even late in development. Agile processes harness change for the customer’s competitive advantage.
  + Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
  + Business people and developers must work together daily throughout the project.
  + Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
  + The most efﬁcient and effective method of conveying information to and within a development team is face-to-face conversation.
  + Working software is the primary measure of progress.
  + Agile processes promote sustainable development. The developers, sponsors, and users should be able to maintain a constant pace indeﬁnitely.
  + Continuous attention to technical excellence and good design enhances agility.
  + Simplicity – the art of maximizing the amount of work not done – is essential.
  + The best architectures, requirements, and designs emerge from self-organizing teams.
  + At regular intervals, the team reﬂects on how to become more effective, then tunes and adjusts its behavior accordingly.

These 12 principles provide a clear guidance to agile project managers when they conduct their works. According to the 2011 CHAOS Manifesto from the Standish Group, Agile projects are three times more successful than Waterfall projects. **(ref 28)** Agile project management is attracting more and more people's attention, transfer companies’ project management process to agile one will benefit them. When ﬁrms make it through the difﬁcult transition period, take the ideology of enablement to heart and implement it consistently, then they are likely to get the kind of results that we see at Apple, Autodesk, Alibaba, Salesforce and elsewhere. **(Ref 14)**

Several methodologies have evolved with Agile at their core, including Extreme Programming (XP), Scrum, Lean Development, Features Driven Development (FDD), Agile Uniﬁed Process (AUP), Dynamic Systems Development Method (DSDM), and the Crystal Method. **(ref 5)** Scrum is a framework within which it is possible to employ various processes and techniques to develop complex products. (Ref 9) This feature makes it popular among project managers. We can see many articles investing about how Scrum helps a distributed team work efficiently and how it works well in many industries, like construction industry, advertising industry and bank.

1. **Success factors**

Instead of the prevailing vertical ideology of control, Agile and Scrum reﬂected a horizontal ideology of enablement. **(Ref 14)** The structure of agile management with Scrum not only makes the team to be flexible, but also makes the team communication-free. Product owner, scrum master and the development team members have an equal opportunity to express their ideas and gain the feedback efficiently. In this kind of working model, people meet each other more frequently and the whole team’s productive capability relates to the interaction in some certain way. Therefore, human factors play an important part in investigating the success factors of Scrum. Scrum master usually being regard as a team leader in the project, and is intriguing as it is key to the success of the Scrum team, yet it offers “neither authority nor an attractive title” (Watts, 2013, p. 21)（**Ref 6**）. The master acts as a bridge between his/her team and the product owner. The success of the team relies heavily on his/her ability to balance the expectations of these two entities. (**ref 7**) Servant leadership and shared leadership are regard as an efficient approach to be implemented in the work. Greenleaf (1977) introduced the concept of servant leadership 40 years ago, defining a servant leader as someone that seeks to serve first and then to lead. (**Ref6**) However, Smith et al.’s (2004, p. 89) argued that, servant leadership “tends to cultivate a static approach to the external environment.” (**Ref 6**) They believe servant leadership is not suitable in the dynamic project especially when approaching Scrum methodology. Another voice regard shared leadership as a vital element to be success. When the team and team leaders share leadership, leadership is rotated to the person with the key knowledge, skills, and abilities for the particular issues facing the team at any given moment. (**Ref36**) Apart from leadership, there are some other aspects had being investigated, like Openness, Results Orientation, Ethics, Communication, Strategic and Creative and Innovative. (**Ref 30**)

1. **Gap**

Agile project management is popular over the world, companies adapting this approach to seeking productivity and competitiveness. Among different kinds of agile tools, Scrum is the most popular one. massive of researches talk about how agile could be successful, while few studies giving attention on what successful elements contribute to the implementing Scrum approach when doing agile project management. For understanding what influence the success of agile project management with Scrum, three aspects will be investigate. First, the scope of the project itself. Second, team members including product owner, scrum master and development team member. Finally, 10 top failure factors will be reranked to give an indirect support.

# Method and data

Although several researches talked about the success factor of Scrum, most of them focus on one point. For example, when research talking about leadership, they do not link it to their project scope. When talking about the success of the Scrum, whether the project content and project team members have certain relationship is still unknown. This paper aims to give an overall research about how these two aspects contribute to the success of the agile project management with Scrum, and what is the connection between these factors. What is more, a reranking list of failure factors will show up to give an indirectly support for the theme.

The research approach was offering a questionnaire survey to people who have experience in the agile project management with scrum. The questionnaire survey is a quantitative study where the analysis is required to approach the truth.

## Questionnaire approach.

Using a questionnaire to investigate the success factor is the most convenient way in the current situation. The Scrum teams, which the researcher can reach, distribute in different areas of Australia and China. Therefore, a face to face interview method would be unrealistic even though this kind of method is more flexible and could find more valuable information. The participant is required to have experience in agile management with Scrum; therefore they can offer some reliable and practical information for the research. There are 20 participants involved disguisedly in the research. Most of the participants are between 18 to 30 years old, and they work in 13 different industries which can provide abundant data and many different viewpoints of Scrum. Multiple job background is helpful in this research, because the wider range of the participants, the more feasible and reliable of the success model. However, more participants are expected to be involved in this research as it talks about the preference of the success model. Not only the quality but also the quantity of the participants is essential. This paper is going to give initial research about the tendency of the success model, further works would be processed in the future to make this flaw up.

## Details of the [questionnaire](javascript:;).

**Q1**: What is your age range？

**Q2**: Which industry are you working in now？

**Q3**: what is the development stage of your company？(start-up, development, stable, sustainable development and decline stage)

**Q4**: What is your role in agile project management with Scrum? (product owner, project manager and development project team)

**Q5**: What is the largest budget of an agile project with Scrum you are responsible for or involved in? [fill in the blanks]

**Q6**: What is the minimum budget for an agile project with Scrum you are responsible for or involved in? [fill in the blanks]

**Q7**: What is the maximum number of iterations of the project process you worked on?

**Q8**: In the agile project with Scrum, what kinds of products you are involved in?

**Q9**: What kind of customers does your product or service aimed at? (Low-end costumer, normal customer, high-end costumer or Luxury consumer)

**Q10**: In your agile project management with Scrum, what is the project team size range?

**Q11**: Rank the Personality Importance: in agile project management with Scrum, rank the following aspects for the product owner. (Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience.)

**Q12**: Rank the personality importance: in agile project management with Scrum, rank the following aspects for project managers. (Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience.)

**Q13**: Personality order of importance: in agile project management with Scrum, rank the following aspects for the project development team. (Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience.)

**Q14**: Do you think the personality of the whole team members is important in agile project management with Scrum？

**Q15**: In agile project management with Scrum, does the personality of the team member affect the success of the project?

**Q16**: Which role do you think is the most important one in agile project management with Scrum? (product owner, project manager, development project team, everyone or no one)

**Q17**: Which role in agile project management with Scrum do you think will affect the quality or success of the overall project delivery? (product owner, project manager, development project team, everyone or no one)

**Q18**: Which of the following three leadership styles do you think is best suited for agile project management with Scrum? (transformational leadership, authentic leadership or servant leadership)

**Q19**: Which leadership behaviors do you think are most appropriate in agile project management with Scrum. (Directive Leadership style, Supportive Leadership style, Participative Leadership style and Achievement-Oriented Leadership style)

**Q20**: Please rank the following causes of project failure in the agile project management with Scrum. (Ineffective Communication, Scope Creep, No or Poor Risk Management, Poor Project Management, Use of Unpracticed Tools and Techniques, Inadequate Project Planning, Shortage of Resources/ Requirements, Lack of User Engagement, Poor Controlling and Monitoring, Inexperienced Project Managers)

**Q21**: What other important factors do you think have affected the agile project management with Scrum?

## Questionnaire set up

The questionnaire was set up in five aspects.

* The project scope research, (Refer to question number 2, 3, 5, 6, 7, 8 and 9.)
* The project team members analysis. (Refer to question number 1, 4, and 10.)
* The project team members’ personalities analysis. (Refer to question number 11, 12, 13, 14, 15, 16 and 17)
* The leadership. (Refer to question number 18 and 19)
* The 10 top of project failure factors. (Refer to question number 20 and 21)

These five aspects include the whole project environment: the project, and the team member. In detail, the project size and type, the personalities of team members and the leadership implemented in the project, these aspects will be analyzed. What is more, 10 top project failure factors would be reranked with considering the Scrum methodology.

There are four types of questions involved in the questionnaire. They are single and multiple choices, gap fillings, and sorting problem. In single choice, researcher provides a range of answers to narrow down the research scope; meanwhile it also gives some certain supports for the research participant. For example, the third question in the questionnaire: what is the development stage of your company？Researcher offered five answers: start-up, development, stable, sustainable development and decline stage. Some participants may not know how to describe the company development lifecycle by using specialized word. The answer would be multitudinous which will increase the difficulty for the research when doing the analysis work afterward. Setting specific choices can make the researcher and participants match each idea and increase the precision and reliability.

### Leadership

In question number 18, (Which of the following three leadership styles do you think is best suited for agile project management with Scrum?), three leadership was offered: transformational leadership, authentic leadership, and servant leadership.

These leaderships are defined as below:

Servant leadership is described as a people-oriented approach in which servant leaders are not motivated by the need for power, but by serving followers, acting beyond one’s self-interest, caring for followers, creating development opportunities, increasing followers' autonomy rather than coercion. (**Ref 6**)

Transformational leadership is the process whereby a person engages with others and creates a connection that raises the level of motivation and morality in both the leader and the follower. (**Ref** a book,p162)

Authentic leadership definition describes leadership that is transparent, morally grounded, and responsive to people’s needs and values. (Ref a book，P220)

These leaderships have something in common. They all have an explicit moral dimension and focus on followers by putting efforts into them and encourage followers to be self-developed so that they could benefit whole project team. Due to the similarity, project managers may feel confused, and they may have hard decision-making to choose the better or more suitable leadership in their agile project by using Scrum. Therefore, doing research about which leadership is more suitable in agile project with Scrum can help project managers confirm their choice of leadership style.

Another reason to choose these leaderships is that they are all playing a vital part in the workplace. The following comment tells the fundamental value of these leaderships: The importance of servant leadership was driven by “the revolution of expectation among young people” that led companies to create more meaningful jobs.(**Ref** 6); In a content analysis of articles published in leadership quarterly, Lowe and Gardner (2001) found that one third of the research was about transformational leadership. (Ref 未给，一本书，P161);and for authentic leadership, people feel apprehensive and insecure about what is going on around them, and as a result, they long for bona fide leadership they can trust and for leaders who are honest and good. (Ref 未给，一本书，P195)

In question number 19, (Which leadership behaviors do you think are most appropriate in agile project management with Scrum.) four options offered as Directive Leadership style, Supportive Leadership style, Participative Leadership style, and Achievement-Oriented Leadership style. The four leadership styles describe how leaders should do in different cases. Directive leadership style characterizes a leader who gives followers instructions about their task, including what is expected of them, how it is to be done, and the timeline for when it should be completed. Supportive leadership style tells the leader to be friendly and approachable, what is more, attending to the well-being and human needs of followers. Participative leadership style let leaders consults with followers, obtains their ideas and opinions, and integrates their suggestions into the decisions about how the group or organization will proceed. Finally, the achievement-oriented leadership is characterized by a leader who challenges followers to perform work at the highest level possible. (Ref: PDF book，P117-118)

### HEXACO

HEXACO aspect was considered by research that should be analyzed to support the success model. Project team with Scrum methodology have more interaction scenarios than the traditional one. Scrum approach tells that people are the core in the project workplace; therefore, investigate and offer a personality preference can contribute to the success of the project.

The HEXACO model of personality structure is a six-dimensional model of human personality that was created by Ashton and Lee and explained in their book. (Ref <https://medium.com/@INjoeTJ/the-6-major-dimensions-of-personality-as-outlined-in-the-hexaco-personality-inventory-fd3cd2b4b07c>)

The questionnaire was designed to find out the trend of some aspects which influent the project's success. Therefore, research is looking for some experience-based answers, which are close to the truth, that could help to analyze the preference of the successful Scrum model.

## Data analysis approach

All the questionnaire was released on 7th October and collected in 10 days on 17th October. Data analysis will be process by using Microsoft Excel. According to the questionnaire content, [quantitative](javascript:;) [analysis](javascript:;) approach was used to analyze the trend of the data.

Question numbers 11, 12, 13 and 20 are multiple-choice questions. The results need to be ranked, where average synthesized score is implemented.

The average synthesized score is defined below:

Where:

Weights are related to the position of the choice.

For example, there are three choices in the question, and the first position is defined as three weights, the second one is two weights, the third one is one weight. If a question was answered 12 times, choice A was chosen in the first position twice, on the second position four times, and third position six times. Then, average synthesized score will be：

Note: Weights has a relationship with the number of options. If there are three options need to be ranked, the first position worth three weights. If there are 30 options need to be ranked, the first position worth 30 weights.

## Data collection and analysis

In the end of the research time, 20 questionnaires were collected. By using Microsoft Excel, creating visual graph to show up the preferent success model.

### The project scope research, (Refer to question number 2, 3, 5, 6, 7, 8 and 9.)

Question Number 2

Question number 3

Question number 5 and 6

Question number 7

|  |
| --- |
| **Product type range** |
| life service |
| design of building structure |
| software design |
| manufactured goods |
| event planning |
| wedding planning |
| market research |

Question number 8

Question number 9

**Comment:**

Many people regard agile project with Scrum methodology only can be applied in some particular industries, for example, information system software. However, with the digital age come into different industries, Scrum methodology is involving in multiple kinds of project. The data indicated that agile project management with Scrum is suitable in a wide range of application scenarios and still popular in information system software industry. On the company development stage, the Scrum methodology is applied to the start-up and sustainable development stages. These two stages require the company to be creative and flexible, which match the feature of the Scrum methodology.

### The project team members analysis. (Refer to question number 1, 4, and 10.)

Question number 1

Question number 4

Question number 10

**Comment:**

The project team size was under the recommendation of the Scrum methodology from 4 to 9 members.

### The project team members’ personalities analysis. (Refer to question number 11, 12, 13, 14, 15, 16 and 17)

Question number 11-12-13

Question number 14

Question number 16

Question number 17

**Comment:**

In question number 15, 100% of the participant agree with that the personality of the team member affect the success of the project and 80% of the participant consider the personalities of the team members is important. For different Scrum role, openness to experience was regarded as the most important personality. The definition of openness to experience: Persons with very high scores on the Openness to Experience scale become absorbed in the beauty of art and nature, are inquisitive about various domains of knowledge, use their imagination freely in everyday life, and take an interest in unusual ideas or people.( Ref <https://medium.com/@INjoeTJ/the-6-major-dimensions-of-personality-as-outlined-in-the-hexaco-personality-inventory-fd3cd2b4b07c>) These personalities support the feature of the Scrum methodology: Flexible and Changeable.

The personality preference for each Scrum role showing below:

The data from questions 16 to 17 indicates that scrum master is the most important part of the three Scrum team roles. Everyone has the possibility to influent the quality or success of the overall project delivery, where Scrum master plays a greater influence on it.

### The leadership. (Refer to question number 18 and 19)

Question number 18

Question number 19

**Comment:**

Supportive leadership style is the most suitable for the Scrum methodology according to the result. 60% of the participants prefer the supportive leadership style. Combing with the personality preference, people with supportive leadership behavior also match the openness to experience trait.

65% of the participant considered the transformational leadership is best suited for agile project management with Scrum approach, and servant leadership has the lowest number of supporters.

### The 10 top of project failure factors. (Refer to question number 20 and 21)

**Comment:**

Human is the key in the Scrum approach, and communication is the key tools. It is not surprising that communication will be the top failure reason, as the project with Scrum methodology requires team to have efficient communication to exchange information so that the whole team can have good productivity with fewer iterations. The second one is Scope creep. Although Scrum approach recommends people to embrace change, while they still need to put effort into controlling the scope creep, this failure factor has the same ranking position in the traditional project. The third one is ‘No or poor risk management’ which is also vitally important factor in all of the project management.

# Research Result

The data draw an overall picture of the success preference:

## Scope

* Agile project management with Scrum could be applied in a range of industry and project scope. It has a preference for information system software industry but also spreads to different industries.
* Companies, which under the stage of start-up and sustainable development, prefer to apply this approach.
* The product produced by using Scrum approach mostly targets normal and high-end customers.

## Human

* Openness to experience personality is important in different Scrum roles. The ranking details showing below:
* Product Owner: Openness to Experience, Honesty-Humility Extraversion, Conscientiousness, Emotionality, and Agreeableness.
* Scrum master: Openness to Experience, Extraversion, Emotionality Honesty-Humility, Conscientiousness, and Agreeableness.
* Development project team: Openness to Experience, Conscientiousness, Emotionality, Honesty-Humility, Agreeableness, and Extraversion.
* Each member in the project with Scrum methodology can affect the final success, where scrum master has a higher possibility of influence.
* The transformational leadership and supportive leadership behavior are mostly suited the agile project management with Scrum.

## Failure factors

The top 3 failure factors in agile project management with Scrum are Inefficient communication, Scope creep, and No or poor risk management. While in traditional project management, the top 3 failure factors are Inadequate project planning, Scope creep and Use of Unpracticed Tools and Techniques.

The ranking of the top 10 failure factors in agile project with Scrum showing below:

1. Ineffective Communication
2. Scope Creep
3. No or Poor Risk Management
4. Poor Project Management
5. Use of Unpracticed Tools and Techniques
6. Inadequate Project Planning
7. Shortage of Resources/ Requirements
8. Lack of User Engagement
9. Poor Controlling and Monitoring
10. Inexperienced Project Managers

# Conclusion (500)

# Reference ()