**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

**Department of Information Engineering**



**Diploma Thesis**

**PROJECT MANAGEMENT TECHNIQUES FOR WEB-BASED PROJECTS**

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# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

# DIPLOMA THESIS ASSIGNMENT

BcA. Purvi Viragkumar Gandhi, BA

Systems Engineering and Informatics
Informatics

Thesis title

**Project management techniques for web-based projects**

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**Objectives of thesis**

This thesis will explore the project management protocols that are available for the web industry. There will be compared four different project management techniques and the set of the most significant element(s) that influence the choice of a proper develpment technique.

**Methodology**

In the first part of the thesis, there will be a literacy review of four techniques used in the web-development: Critical Path Method (CPM), Scrum, Kankan and Kaikaku. In the second part of the thesis, there will be a quiestionnaire designed to measure the effectiveness and/or suitability of concrete projects. A sample of between 80 – 100 participants, including IT project management experts, will be proposed for this study. For making results, there will be used the techniques of the descriptive statistics and multivariate regression analysis. Important variables are time, cost, accuracy, project size and the resources needed to implement the techniques. These variables will be used in evaluating the efficiency/effectiveness of the various techniques for web-based projects. The efficiency will be expressed using time, cost, accuracy, resources and project size.

**The proposed extent of the thesis**
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A.A. Izang, C.C. Ihesiulo, M. Ofuru, C. Okafor, "A web-based project management system", International Journal of Advanced Research in Computer Science and Software Engineering, vol. 6, No. 4, 39-45, 2016.

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Prague on 30. 03. 2021

# Declaration

I declare that I have worked on my diploma thesis titled " Project Management Techniques For Web-Based Projects" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on date : 15.03.2021

**Signature: Purvi Gandhi**

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Thank you all.

# Project Management Techniques for Web-Based Projects

**Abstract:**

A quantitative research design will be adopted in achieving the objectives of this study. In view of this, a questionnaire will be designed with items to measure the effectiveness and/or suitability of four different project management techniques – Critical Path Method (CPM), Scrum, Kankan and KaiKaku – for web-based projects. A sample size of between 80 – 100 participants, including IT project management experts, has been proposed for this study. Descriptive statistics and multivariate regression analysis will be used for analyzing and comparing the four project management techniques under review.

It is also important to state that a conceptual model will be designed around variables such as time, cost, accuracy, project size and the resources needed to implement the techniques. These variables will eventually be used in evaluating the efficiency/effectiveness of the various techniques for web-based projects. In essence, the efficiency of the techniques will register as the dependent variable while time, cost, accuracy, resources and project size will be categorized as the independent variables.

**Executive summary**

Today, several website development companies use various project management tools to improve the performance of their services. An organization may conduct a variety of tasks at one point that needs a number of people or departments to contribute to a multi-level construction process, requiring a strong project management framework. Project management solutions in the IT industry are increasingly developing. With the continuously growing number of people using project management applications, web-based project management frameworks play a vital position in numerous businesses. There is a distinctive role for the accurate, robust, high-quality web apps for consumers in a proper project management framework. Developing and teaching people how a web-based project management framework should perform tasks. The scope of the study is these procedures in the daily work life. Also, the structure of this study was the stability and solidity of a web-based project management framework. Finally, a web-based project management technique is selected among others that satisfy the web-based project management's expectations and needs.

# Table of Content

# 1.    Introduction

The first section of the study would include a literacy analysis of four web-development techniques: Critical Path Method (CPM), Scrum, Kankan, and KaiKaku. A questionnaire intended to determine the feasibility and/or suitability of concrete projects will be used in the second portion of the study. This analysis would recommend a sample of 80 – 100 researchers, including IT project management experts.

The descriptive statistics and multivariate regression analysis methods would be used to generate data. Time, expense, precision, project scale, and the resources required to execute the techniques are all important variables to consider. These factors can be used to assess the efficiency/effectiveness of different web-based project techniques. The performance would be expressed in terms of time, expense, precision, energy, and so on.

Project management strategies explain how we collect information, interact, and get tasks done in the most reliable and productive fashion possible. Project management programs focused on web-based systems are built to handle and store web-based project details. The project applications allow regulated access to data and automated distribution of data by various groups of people such as the Sales Department, software developers or project managers. Orthodox project management methods are the most commonly used in the field. A project manager monitors and reviews project execution. They provide input and instructions to their team based on the project's intended result, which was addressed during the initial planning phases. The aim of cooperation was by integrating their mutual expertise and putting together a range of resources and successes in a mission, making matters quicker, cheaper and healthier. Because legitimate team coordination increases efficiency and speeds up the outcomes and optimizes decision making, useful intellectual resources and resources are also captured. A surprising improvement in output, competitiveness, and efficiency within a business can be accomplished through web project management systems.

## 2.    Background of Project Management

Project management was developed in the 1950s as a day when modern project management started. As in the 1950s, Gantt Charts and casual methods and resources became the key responsible for programs. Then tools and strategies for project management became formalized into more professional and modern solutions. Today's rapid technical development, IT and globalization industries are the key force to carry out projects worldwide as a whole within a given framework, time and cost constraints. New project management programs are today offering creative methods and the new technologies, strategies, systems and arrangements in place are essential for the management process. (Conrad, 2017)

Project management is like a set of acts to better accomplish project milestones, expenses and technological success in a project through collaborating alongside project team members. We may certainly conclude that project management is an orchestrated and deliberately designed attempt to reach a particular one-time target. We first have to establish a project schedule, so we could readily recognize projects and accomplish targets, to describe and validate the project priorities and objectives. The services are then expected to be quantified, expenditures and completion schedules defined. We do not ignore that project administration often entails overseeing the execution of the project schedule, operating daily reporting, ensuring that reliable and objective input is given on the plan and the processes required to enact recovery steps. In general, initiatives require big measures including viability, concept, project preparation, execution, appraisal and maintenance.

Finally, Risk assessment for the project requires maybe the one crucial thing. Risks are found and evaluated arbitrarily in several programs. This is fatal, since there are unpredictable threats that are not expected that must be handled in an emergency scenario. Rather than analyzing each risk individually and at random, defining and organizing threats into groups and then identifying probable risks within each category is much more accurate[3]. This facilitates the dialogue and collaboration on popular stimuli, causes, future impacts and possible prevention steps.

Categorization of threats is a means by which the hazards are systematically defined and the understanding, contain and response is focused. Any future danger must be extensively assessed and the project leader, support staff as well as the project management agency must be examined to see whether it can be effectively handled. There are several various kinds of threats and we have to select what to do with each form on a project-by-project basis.

IT project management (ITPM) is an IT project management method to accomplish IT aims by controlling the strategy, organization and responsibility. Because the IT hits most organizations, the scale of these ventures may be broad and complicated. IT project management often involves more than merely integrating expertise, aligning abilities and utilizing regular methods and strategies to complete a project[4]. IT project managers address the pressures of interdependent integrations, accelerated technical advances and potential version revisions during the project timeframe (Westland, 2006).

## 3.    The life cycle of Web base IT project

The ITPM lifecycle involves five basic tasks, but it is how the project lifecycle is handled that is the biggest distinction for IT project management. There are seven stages of Web Development Projects Cycle . The Scrum methodology is the most popular ITPM approach which requires a linear prediction. Any stage is started and finished until the next step is transferred. The whole project is specified before start. The Iterative methodology uses a more progressive approach. The iterative or gradual method repeats steps, and at the conclusion of the iteration, completes phases of design, research and preparation with the potential to accomplish a particular objective (Westland, 2006).
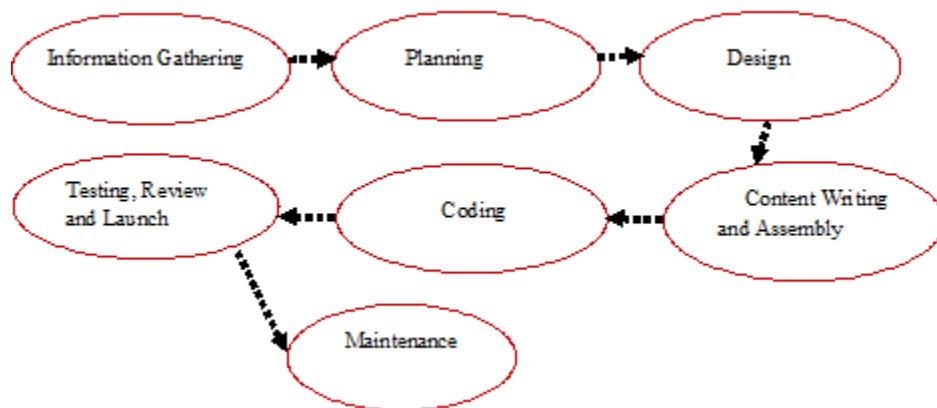
Fig.1 IT Project Life Cycle

## 4.    Characteristics of Web based IT projects

Now as we know there are certain characteristics of web-based projects and they are (Vince Bruno, 2005): -

*Mobile Compatibility***-** As more as people are using mobiles today, they are creating a network within themselves by connecting though internet; therefore, creating a mobile optimised website has become very important.  And to get comfortable with this mobile based website first we need to check that our existing website is working properly or not, and if it does not work properly or get accessed to the mobile, a mobile version of the website can be created by the help of mobile web site builders.

*It Should Be Accessible to All Users* – These websites should be accessible to all users whether they are blind, elderly or disabled they should have that privilege to enjoy this system. These people who are elderly, blind or disabled mainly use screen- reading to access the internet. There are 508 guidelines to website accessibility which can easily assure about the accessibility of the screen readers. Due to this system this website is also available to a larger audience.

*There Is a Well-Planned Information Architecture* – how the websites are presented is a very important so there should be always a well-planned architecture for that, but it is often neglected. Nowadays, where these websites and internet has become such an important part of our life so if there is not any well-planned structure then it won't attract the people in other words if the marketing strategy is not good it won't attract the users and the marketing strategy should be made in such a way that it can be easy to understand for the user and also becomes attractive to them. This is mainly useful and important for company's websites.

*The content should be well formatted* – the format of the content should be well formatted so that it can become easy to scan. For example, in case of "Wikipedia" a key part of the content is highlighted at the top, so the user does not read the whole content and it becomes easier for them to understand that what is the key part of the content, so they do not have to read that content from top to bottom. Users can quickly search the content sections for their specifications. And for all these it is very much important to format the content in a well manner like for example headings after that sub- headings, bullet points etc.

Time to loading **-** One of the major factors is the time, especially nowadays, we live in such a busy world where there is no time to waste it becomes very annoying for the people or users if they visit the websites and have to wait for too long. Slow speed of the websites is one of the main reasons

for leaving a website. The websites builders have to make sure that it does not take more than 4-6 seconds. Due to this the users do not get satisfy which also affect the search engine ratings or rankings.

*Consistency in browser* – The consistency or the compatibility of the websites are often overlooked. Due to all these reasons the good, reputed companies often get neglected as their services are not good and they lack in providing the services as per the users need and it creates a negative effect on the website which brings down the position of the website. Nowadays the websites although have become more powerful and efficient in nature that's why these problems arise less in number. They work more efficiently but still it should be kept in check that the websites are working efficiently and in a proper manner through every browser like "Google", "chrome" etc.

*Good Navigation* – Effective and good navigation is one of the main and crucial things in the aspects of websites. For example, HTML and JavaScript works best and appears consistently on all the browsers and platforms. It is very important for the navigation to keep the waste out of the box which means in other words that it should be clutter-free meaning there should not be something in extra or the websites should possess extra thing which will waste our time. There should be limit and the main things only should be included there so that it can save the users time and can be easy for them to search. There should be good search features, custom 404 pages, good internal linking etc. (Management, 2019)

*The Product should have a good error handling process*- it would be a very useful thing for the user if there is a good error handling system in the websites. So, the people or a user does not worry about the error in the system. But we often see that it overlooked. Correct handling of errors can lead the system free from bugs.

*Valid mark-up and code cleaning* –A websites which bonds with relevant web designs and their standards are more efficient and the user can depend on that easily in other words it is more dependable. It also makes sure that the website is bug free and is consistent across the browsers and the respective devices. It also helps in the speed, the loading speed increases, the errors and troubleshoot are also easier to locate if the need arises.

*Contrasting colour scheme* – Good contrast between background and text is very important. The contrast between the background of the website and the content is very important and also basic. It becomes easy to read the content.

*Useable forms* – Forms are one of the important things in the business purpose websites. Users can easily handle and interact with the sites. It is easy and accessible to everyone. In the business websites it is also used to increase or generate the leads.

## 5.  IT Project Manager's core duties

The IT project managers today have a lot of projects and tasks to work with. They must handle the development of firmware and applications, the creation of websites, data base storage and maintenance, and develop dynamic infrastructures and networks, many of which have a variable spatial component when preparing future data and security threats[5].The IT PM establishes targets, interacts and motivates team members and partners, determines tools for each mission, investigates, oversees the modifications, executes requires evaluation and sequences activities appropriately (Management, 2019).

- The IT Project Manager also has the following extra responsibilities:
- Planning and supervision of programs as a whole
- Help for initiatives to be supported and introduced.
- Ensuring overall technical ability
- Reduce jobs to a minimal.
- Usage of the abilities of team member
- Cost management and budget retention.

One of the most daunting problems of IT projects is the complexity and interdependencies of big long-term, distinct ISPs.

Those are some of IT project managers' few critical hurdles.

- Create some predictions when combining the current infrastructure with various hardware, networks and applications.
- The sector, end-users and stakeholders have no clear expectations.
- The technology is increasingly evolving and needs interim updates which can impact timelines.
- Diverse geographical areas and related remote jobs

## 6.    Definition of Successful Web IT project management

Effective IT project management blends best principles with the art of problem management, transition, standards, and more to incorporate standard project management

The first stage is to choose a framework for project management that is relevant to your team's expertise and project goals. Here are some tips for making your next IT project successful:

- Initiation: Make sure that you determine whether the project utilizes money well and whether the product of the project would fulfill a company needs.

- When planning: Fulfill the project charter and consider mission dependencies and how deadlines that have been skipped will influence the overall timescales.

- During the operation: hold regular stand-up meetings and over-communicate to address status and any project blockers.

- Monitoring and control: make sure you have the correct PM tool in order to monitor success in real time.

- When closing: Do a retrospective project which answers what was fine, what might have been better and what might have improved next time.

## 7.    Aims and objectives of Successful Web Project Management

- To discover the project management guidelines those are necessary for the IT industry.

- To evaluate four separate project management strategies and decide the one that is most effective.

- To evaluate the most important element(s) that affects the selection of a project management methodology.

- To make decisions on the appropriateness of assessed project management strategies for web-based ventures. (Management, 2019)

# 8.    Project management techniques

## 1. Critical Path Method (CPM)

Certain tasks that must be executed in a logical pattern and for certain periods are a critical path to project management. The Vital Path (CPM) is a simple project management approach. CPM needs you to create a project model that contains a list of all tasks, the time required to complete each of those tasks, and what dependencies, if any, exist between the tasks and the project's endpoints, such as deadlines and deliverables The Critical Path Method (CPM) is an algorithm used to plan, manage and analyze a project's timing.

With this detail, we can determine the shortest path from the scheduled tasks to their completion, including the earliest and latest times these tasks can begin and end without interfering with the project's timetable. we know which projects are vital to the project and which can be postponed or extended without extending the project schedule (Davidson, 2019).

As a consequence, CPM is a set of projects that add up the longer total duration, irrespective of whether the variable is (free variable or absolute float) or not. With this knowledge, we can determine the shortest period of time available to complete the project.

The CPM system bit by bit helps in the identification and prevention of temporary risks and critical and non-critical tasks from start to finish projects. There is zero runtime reserve for critical tasks. The terms of the whole project will shift if the length of certain activities varies. That is why critical projects need to be timely monitored and risk detected.
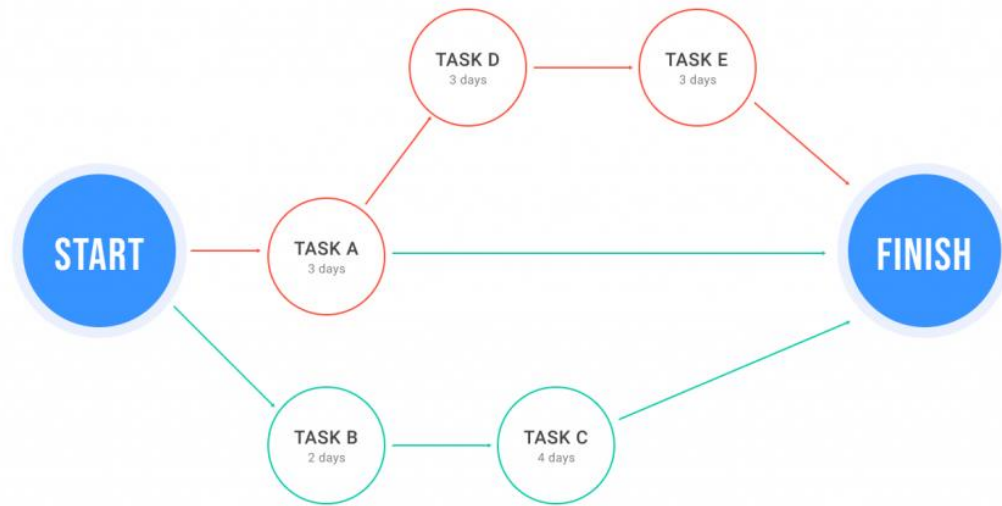
Fig.2 CPM Structure (Inspired by Google)

## ➢ **History of CPM**

The critical path method (CPM) is a project management methodology created by DuPont's Morgan R. Walker and Remington Rand's James E. Kelley Jr. in the late 1950s. Kelley and Walker reminisced about the evolution of CPM in 1989. Kelley credits the word "sensitive direction" to the creators of the PERT, which was created at the same time by Booz Allen Hamilton and the United States Navy (Davidson, 2019).

Critical Path Mapping is widely used in a number of fields, including architecture, aerospace and defense, software development, research ventures, product development, manufacturing, and plant maintenance. This mathematical analysis approach can be used on any project with interdependent operations. CPM was first used for large skyscraper construction in 1966, when the old-World Trade Center Twin Towers in New York City were being built. Even though the original CPM software and approach are no longer in use, the term is now used to characterize any tool for evaluating a project network logic diagram.

The most critical strategy for using CPM is to build a project model that contains the following:

- A list of all the tasks that must be completed in order to finish the project (typically categorized within a work breakdown structure),
- The amount of time it would take to complete each task (duration).
- The practices' interdependencies and,
- End points that are logical, such as milestones or deliverables.

## ➢ The advantages of Using CPM Techniques into Projects

- The approach provides a simple graphical image of projects.
- It identifies the most critical functions.
- Saves time and assists in deadline management.
- You should equate the expected status with the current status.
- Both essential tasks that need intervention are listed.
- Dependencies are made clear and straightforward.
- It determines which operations should be carried out in parallel.
- It aids the project manager in defining the project's most important elements.
- It provides a realistic and disciplined foundation for deciding how to achieve the goals.
- In the management of new ventures, CPM is successful.
- If correctly implemented, CPM can help a team's understanding.
- CPM offers proof of dependence.
- CPM allows for the visualization of dependencies, which aids in the scheduling of individual tasks.
- As a network diagram, it depicts the events and their consequences.
- It lays out a clear and succinct protocol for project documentation.
- It assists in the estimation of slack time.
- A method for communicating project planning, deadlines, and time and expense results that is transparent and consistent is created. (Davidson, 2019)

- It's extensive and In industry, it is widely used.
- It assists in optimization by deciding the length of the project.

> ➢ **Disadvantages of Using CPM in to Projects**

- The CPM is not in favor of personnel scheduling.
- It's impossible to predict an activity's completion period in CPM.
- In CPM, the critical direction isn't always apparent.
- CPM networks can be difficult with broader ventures as well.
- It also doesn't bother with resource distribution management.
- Critical path must be determined precisely in CPM.

## 2. Scrum/Agile

Building a new Web based product is a daunting challenge and making it a success in this dynamic environment is much more difficult. It can be difficult to determine which of the many methods and techniques available is best suited to your product. In this sense, Agile and Scrum normally are at the top. Both words of mouth are typically used interchangeably; however, they vary significantly (Management, 2019).

The main distinction between Agile and Scrum is that while Agile is a project management theory focused on a core collection of ideals or principles, Scrum is a particular Agile approach for project management.

A strong example is the distinction between a recipe and a diet. A diet is a set of strategies and procedures depending on the beliefs and ideals you adhere to. A recipe is a framework for implementing the vegetarian diet. This is similar to the relationship between Agile (your diet) and Scrum (your diet plan you follow ). If I would express, it in technical terms:

Agile is a collection of techniques and strategies focused around the ideals and concepts outlined in the Agile Manifesto, such as teamwork, self-organization, and team cross-functionality. Agile appears with a variety of flavors, which means there are several subsets of the Agile Project Management philosophy. One of them is Scrum.

Scrum is a system for implementing the Agile Mindset by managing tasks, activities, objects, and rules/guidelines. It is a more sophisticated version of Agile that takes the basic concepts of Agile while applying its own twist to create a much more distinct approach.

Overall, agile and scrum are not interchangeable. To explain the Scrum philosophy, we must first understand what Agile is.

## ➢ Structure of Agile:

An agile methodology for the development of web applications, which encompasses the principle of agile modeling, adopts standard architecture and is focused primarily on models, accelerates system analysis, design and execution, has been proposed. A series of lightweight approaches to designing applications is recently categorized with the term agile. Extreme Programming (XP), Adaptive Software Development, and Dynamic Systems Development Methodology are a few examples (DSDM) (Management, 2019) .

According to the new market, Agile is an application development technique that employs an iterative approach. Teams use many Agile methodologies to schedule launches and then focus on "sprints" that obstruct new applications continually and learning from customer reviews.

In general, the Agile project management process can be divided into four stages:

Envision – develop a high-level product/service vision for consumers and decide who will be participating in the process.

Speculate – an extension of the "Envision" process, in which teams assemble the initial broad specifications for a product/service and create an iteration schedule based on the vision.

*Explore* – concentrate on the outcome of the project in order to obtain consumer reviews as quickly as possible, with an emphasis on flow.

*Adapt* – examine findings delivered and respond to current circumstances as necessary.

*Close* – finish the project, transmit main results.
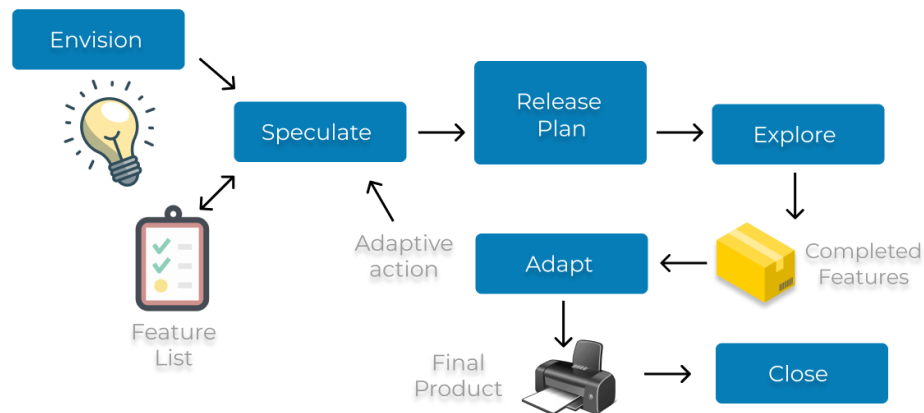
Fig.3 Agile Structure (Inspired by Google)

## ➤ **Structure of scrum:**

Scrum is a small team of leaders led by Scrum who are mostly responsible for removing obstacles to completion. Scrum is an Agile project management methodology. Work on sprints is completed in fast blasts, and the team periodically collects to analyze current practices and any roadblocks to be cleared. Scrum is a project management method for quick growth and checking, particularly in a team.

Scrum is an agile technique of its kind. Specifically designed to allow teams to work successfully in diverse projects with evolving demands on a regular basis, the essence of this structure is openness, transparent collaboration, adaptation and continual improving. Scrum can complete all tasks correctly and easily through experts who test program or online tests of some kind (functions tests, efficiency tests, unit tests and some other type). It is also critical that all project team members retain continuous and well-established contact. Tests also communicate with developers through agile development with the use of the Scrum system. (Management, 2019)

<u>Scrum principles</u>

1. Supervision of the scientific process: The Scrum strategy is focused on accountability, evaluation and adaptation.

2. Self-organization: This principle increases the team's independence and productivity.

3. Teamwork is particularly important in each release's work. Knowledge, clarity, and distribution are all critical.

4. Priority optimization Activities in Scrum are regularly prioritized in order to assess the order in which those tasks must be done based on their importance and significance.

5. Timeboxing: it means distribution of certain hours for certain tasks and arranging them. In Scrum, science is performed in "sprints" cycles (usually 2-4 weeks). Tasks are established during sprint preparation, typically around 1-2 hours, tracked and addressed during regular meetings (usually around 15 minutes).

6. Iterative development: As the project requirements in Scrum are constantly being adjusted and revised, software development activities in this framework are also repeated, revisited, and reworked to create the best product. (Management, 2019)
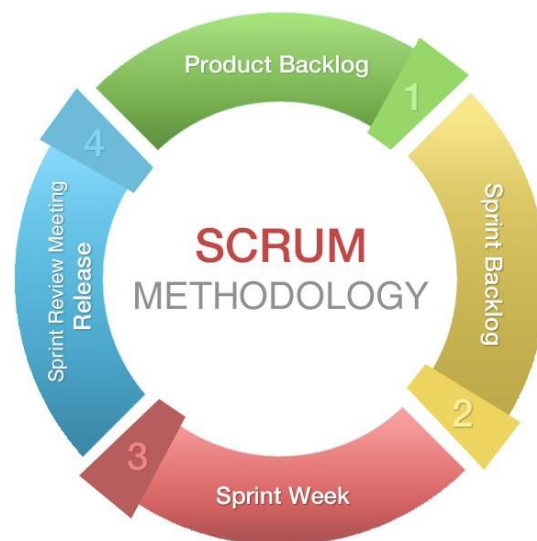
Fig.4 Scrum Structure (Inspired by Google)

## ➢ History of Scrum/Agile

The term scrum was first used in a paper titled "**The New New Product Creation Game**" in 1986. The word comes from rugby, where a scrum is a group of players. The creators of the paper choose the word scrum because it stresses coordination. Scrum is often written in all caps, as SCRUM. Although the term itself is not an acronym, the capitalized styling is most definitely a result of an early paper by Ken Schwaber that capitalized SCRUM in its title. Although the copyright for the word Scrum has been permitted to expire, it is held by the larger group rather than an individual, thus the leading capital for Scrum is maintained in this paper. (Management, 2019)

Ken Schwaber used Advanced Development Methods in his business Scrum in the early 1990s, while Jeff Sutherland, John Scumniotales, and Jeff McKenna used the same term Scrum in Easel Corporation. Ken and Jeff have collaborated closely in order to incorporate their theories into Scrum. They also tested and developed Scrum continuously, contributing to their 1995 paper, the 2001 Agile Manifesto contributions and the global dissemination and use of Scrum since 2002.

In 1995, at the Company Object Designee Workshop, which took place as part of Object-Oriented Programming, Frameworks, Languages, and Application '95 (OOPSLA '95) in Austin, Texas, Sutherland and Schwaber presented jointly a paper that portrayed The Scrum paradigm. Over the coming years, Schwaber and Sutherland worked together to put the content into the creation of what was known as Scrum, together with their expertise and evolving good practice.

In 2001 Schwaber focused on the process in the book Agile Definition of Software with Scrum, in collaboration with Mike Beedle.

Scrum's approach to product growth strategy and management includes getting decision-making authorities to the operational stage. Schwaber formed the Scrum Alliance along with others in 2002 and developed the Certified Scrum Accreditation Series. Schwaber left in late 2009 the Scrum Alliance and created the Scrum.org parallel accreditation series for Professional Scrum.

Since 2009, Schwaber and Sutherland also written a public document called The Scrum Guide. It was updated 6 times with November 2020 as the latest edition.

## ➤ Advantages of Using Scrum Methodology in Web based Projects

- Agile scrum allows the enterprise to save money and time.
- The Scrum approach allows projects to be built where the documentation of market specifications is difficult to measure.
- In this approach, cutting-edge advances can instantly be coded and checked as an error can easily be corrected.
- It is a mildly supervised approach that stresses daily meetings and periodically discuss progress in practice. The project creation is therefore clearly visible.
- This is also iterative in essence, like every other agile technique. Continuous user feedback is necessary.
- Instead of short sprints and continuous input, the improvements are simpler to handle.
- During daily sessions, human efficiency may be measured. This adds to the efficiency gains for each member of the team.
- Problems are detected early into the day in advance and can thus be easily solved
- A better commodity is easier to produce on budget.
- Agile Scrum can work in any language but is especially useful for quickly moving web 2.0 or digital media ventures.
- Method and administration overhead costs are low and thus result in a faster and cheaper outcome.

## ➤ Limitation of Using Scrum Methodology in Web based Projects

- Agile Scrum is one of the leading triggers of a shrinking reach, as project management partners are inclined to continue to demand new features without a specific end date.
- If a mission is not clearly specified, it would not be precise to estimate project expense and time. This will stretch the job over many sprints. In such a situation.
- If the team members are not involved, then the project will never be finished or abandoned.
- It is ideal for small, fast motions when only small teams are running well.
- This approach needs team members who are seasoned only. The project cannot be finished on schedule if the team consists of individuals who are novices.
- For project management, Scrum operates very well whether the Scrum Master respects the team it manages. It can be incredibly stressful for them, leading to demoralization and project stagnation, if they exert too tight control over the team members.
- If one of the team members leaves for development, the reverse impact on the project development may be massive. (Conrad, 2017)
- It is difficult to incorporate and quantify the project quality manager without the test team being able to do regression tests after each sprint.

## 3. KAIKAKU

### ➢ History of KaiKaku methodology

KaiKaku signifies a drastic shift in an entire enterprise, normally in the context of a project. KaiKaku is typically implemented by management because the execution and results would have a direct effect on the enterprise. KaiKaku is all about incorporating new information, new methods, new approaches, new manufacturing techniques, or new equipment. External causes, such as new technologies or business dynamics, may prompt KaiKaku. KaiKaku may also be implemented when management determines that dwindling returns from existing Kaizen activities indicate the need for more drastic reform. KaiKaku programs often result in 30-50 percent changes and a new baseline for ongoing Kaizen. KaiKaku may also be called System Kaizen.

KaiKaku means that a whole company, usually in the form of a project, changes fundamentally. The management is most frequently initiated when the execution and results have a huge effect on the organization. It's about incorporating new knowledge, new methods, new approaches, new techniques of manufacturing or new facilities. External causes such as emerging technologies or business dynamics may contribute to it. It may also be introduced as management judges propose a need for dramatic reform to decrease the changes resulting from the continuous Kaizen efforts. Projects often lead to 30-50 percent changes and to a new foundation standard for Kaizen. Device Kaizen can also be named. (Radenkovic, Jeremic, Todorovic, Djapan, & Milosevic, 2013)

### ➢ Structure of KaiKaku

KPM is a practice of managing projects that uses human beings' innate perceptive ability. We humans are born with the perceptive capacity that allows us to take a broad-based picture of the future. This is an opportunity to motivate people to build missions in order to fix challenges in general. Creative creativity and experience-based insight are combined in this quality of task development, which is the secret to the project's progress. By using many strategically related development programs, KPM facilitates the development of future profit.. Missions to reform an

enterprise can not only be produced by the top managers, but also by the whole organization. But in the enterprise, missions are typically buried. KPM is built to develop a mission-friendly organizational culture that can uncover excellent visions for change from the whole organization, relate these outstanding visions to the overall business agenda and use them to build a future-oriented value for reform initiatives through project management.

KPM offers an information base for the development of key leaders who are responsible for the investment recovery. The primary purpose of the leaders is to execute tasks. They are also responsible for managing any task assigned by its founder or owner, over the whole life cycle (development, planning and results). The primary reform responsibilities lie with the central leaders. They play a part in facilitating the change by using the 'intellectual capital' that the organization accumulates for the next generation. By supplying an information and technique body, KPM facilitates human resources growth. KPM suggests a technique to avoid vulnerability in the company of defeat and resistance. In the event of conflicts of interest, confusion or the impact of employee education etc., a change project is likely to create internal opposition. Two distinct solutions can be sought. Firstly, it would incorporate a project-oriented human resources framework that will represent employee reform plans and efforts in their performance evaluations.

Secondly, the growth of human resources around the organization. It is important to prepare key leaders of the next generation by giving our workers a normal corporate experience but also a variety of careers to reassign their employees in accordance with their project experiences. KPM presents a way to tackle complicated, vague and unknown problems. It is crucial to adopt an epistemological approach to encourage awareness of the management of projects in order to address company-wide problems. Simulation is helpful to clarify the framework on the basis of interdisciplinary methods, system-based hypotheses and case studies. Therefore, the simulation is used to describe the structure, function, and actions of complex, unclear, unknown phenomena in project modeling based on theory and research experience, based on interdisciplinary methods, hypotheses based on complex system research, and case studies. (Radenkovic, Jeremic, Todorovic, Djapan, & Milosevic, 2013)
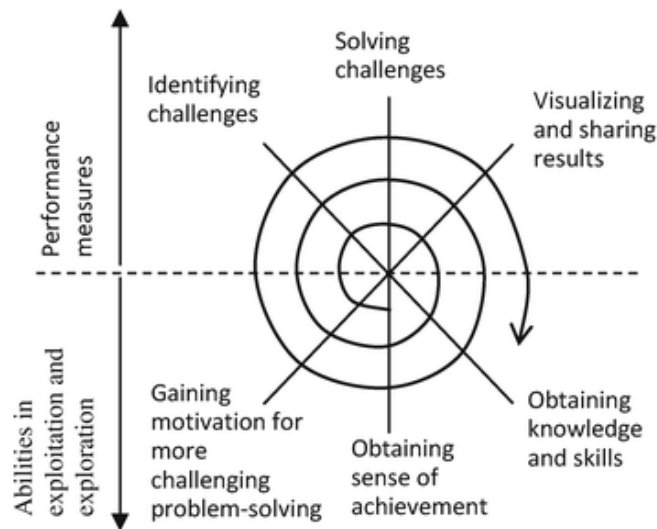
Fig.5 KAIKAKU Structure (Inspired by Google)

> ➢ **Advantages of Using KaiKaku in Web based Projects**

KaiKaku is most often used according to the analysis in manufacturing or industrial projects. The KaiKaku approach will be extremely difficult in the current time of development of the site, but the benefits are not very significant when we use it in combination production and IT.

• Mission shared, leadership shared and innovated: Objective, strategic purpose and top management involvement clearly formulated and communicated

• Appropriate structure: organizational architecture that allows for imagination, teaching and engagement • Key individuals: promoters, champions, goalkeepers, etc.

• Excellent teamwork: sufficient team usage to resolve local, cross-functional and inter-commercial issues

• Individual development: Long-term training dedication to maintain a high degree of experience and learning skills

• Comprehensive contact: between the company and beyond. Extensive communication. Three directions internally – forward, down and sideways.

• Strong interest in innovation: engagement in the ongoing development of operations around the company

• Outside focus: Consumer orientation internally and externally. Big networking

• Entrepreneurial climate: a positive approach to creative ideas, backed by appropriate systems of inspiration Learning organization: High degree of participation in constructive experimentation, problem-solving and collaboration, experience sharing, capture and distribution inside and outside the organization.

> ## ➢ Limitation of KaiKaku in Web Projects

- Increased resources and time: The resources needed for effective implementation of KaiKaku are far greater than usual kaizen events. Because of the importance of the transition, senior management must be involved in this process. This requires them to put other tasks aside and decide mostly about the destiny of the company if anything goes wrong.

- Creativity and capital: KaiKaku is to contribute to a transformative transition that drastically enhances the organization's bottom line and/or profit source. This takes innovative concepts so you can think beyond the box, but also the money to allow your creative ideas to be applied. A Lean method is often meant to make more with less, but for KaiKaku, the big improvement that you are aiming for often requires a little money. However, with KaiKaku, the profits are generally great, thus investment income valued and seen more rapidly than average.

- Especially human beings are the problems which typically occur while attempting to fundamentally change any organization. Lack of managerial encouragement, modifying employees' workplace patterns or altering pre-established concepts inside the organization is the main challenge when developing KaiKaku and in the best of situations, implementing minor modifications that have little to do with the values and basics of the framework. It would be important to know how to market radical proposals to other interested parties and to resolve the opposition to reform in order to register these reforms. (Radenkovic, Jeremic, Todorovic, Djapan, & Milosevic, 2013)

## 4. Kanban

### ➢ History of Kanban

Among today's agile software teams, Kanban is very prominent, but the Kanban working methodology dates back over 50 years. Toyota began to optimize its engineering processes in the late 1940s on the basis of the same model used to store its shelves by supermarkets. Supermarkets stock only sufficient goods for the needs of the consumer, which optimize the flow from the supermarket to the consumer. When inventory volumes meet demand trends, in inventory control, the supermarket improves dramatically by reducing the surplus inventory supplies at any given period. The supermarket will always guarantee that the given commodity is still on stock for a customer. (Brechner, 2015)

The aim of Toyota's extension of the same method to its factory floors was to properly match its mass stock levels with the real material use. The employees will transfer a card, or "Kanban" through departments, to coordinate capacities on the factory floor (and to suppliers in Realtime). When the basket was empty of materials on the production line, a Kanban was moved into the warehouse to describe the material required and the exact quantity, etc. The store had a new basket of this material, which was then sent to the floor of the plant, and in turn it was sent to the supplier with its own Kanban. The retailer will even provide a bin of this unique material to be delivered to the factory. With the evolution of the signaling technologies for this method since the 1940s, this production process is still at the forefront of the process "in time" (JIT).

### ➢ Structure of Kanban

Kanban is a pull system – that is, if the team has skill to do this, the job is dragged into the system instead of assigning tasks from above Without any modifications to the team composition, Kanban can be used to enhance procedures and workflow performance.

It is necessary first to understand and follow its fundamental principles before implementing the Kanban method within your company:
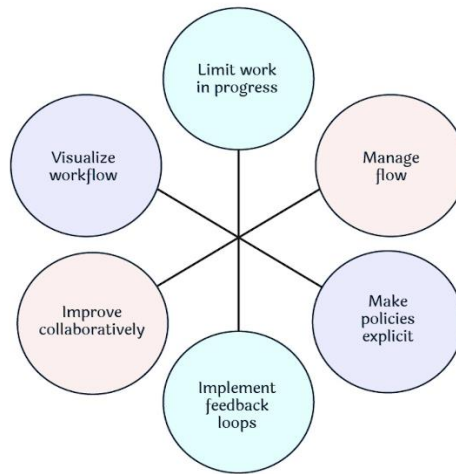
Fig.6 KANBAN Structure (Inspired by Google)

- Kanban has no specific configuration and can be immediately added to the existing workflow. It can be applied quickly when the present procedures do not have to be modified. Kanban's incentives are progressive and any improvements in the process are taken over time.

- Sweeping changes will divide teams, interrupt flow and impair results. Kanban is built to resist the most by promoting constant, progressive and evolutionary improvements

- No systemic improvements should be made at the beginning. Kanban acknowledges the importance and worthwhile maintenance of current structures, functions and obligations. Instead, Kanban promotes progressive reform to prevent emotional opposition.

- Kanban encourages leadership amongst both stakeholders and decision-making. If the lowest member of the team has a reasonable idea, he should be remembered and approved. In order to achieve optimum efficiency, everyone should support a constant development of thinking (Brechner, 2015)

## ➢ Advantages of Kanban Methodology in Web based Project

- Improved vision: Visualization is an important Kanban technique, and the Kanban Board is the most significant aspect of the system. Any project has to fulfill a backlog of projects, and a variety of procedures indicate that a job must be done in advance. All will

immediately see with the Kanban board how the work is going. The flexibility of its visual presentation makes for fast identification of bottlenecks.

- Quality improvement: Each product manager would like to do more. The most apparent advantage of using Kanban is that it improves flow performance shortly after your company implements the process. Visualizing the method will easily emphasize points of inefficiency. It's time to begin asking questions until you have established your problem! The Kanban board plainly demonstrates bottlenecks, stalled tasks and so much work under way. Any barrier that you remove makes the operation more effective and seamless.

- Improving efficiency: The next advantage Kanban, which is increased productivity, is inherently improved performance. Kanban improves your productivity by switching your attention from job to work.

- Team overload management: Traditional methods of management depend on early preparation and on the staff. This adds to teams having trouble with more work than bandwidth. Kanban recommends a pull method – the team can pull tasks into the workflow only if they are willing. One of Kanban's key practices is to place restrictions on the condition of the process. No new tasks will enter the state until the WIP limit is hit, before another task leaves. WIP constraints prohibit teams collaborating concurrently on so many projects. (Brechner, 2015)

- Increased emphasis on the squad: Multitasking can increase your efficiency but dividing your focus – also known as context shift – is expensive. Depending on the task and person involved, context switches may trigger wasted 5 to 30 minutes per task.
No new tasks may be pulled into a process state with WIP limitations in place before another task is done. Kanban assists members of the team by allowing them to concentrate on only one task at a time instead of splitting energy between several job objects.

- Waste reduction: Waste disposal or waste reduction is a pillar of lean management. Waste is characterized as any behavior utilizing value-free resources. The value means something for which the buyer is prepared to pay. Many practices are not classified as "value-adding," but are nonetheless important to quality goods. The goal field is a waste of little importance.

- Flexibility: The pursuit of market resilience is motivated by the desire for versatility for many businesses. For businesses in specific early stages, it is important for sustainable growth that they have the freedom to adapt rapidly and decisively to the demands of their clients and competitors. Features are launched as soon as they are finished without the

prescribed step period. Product managers should re-assess immediate goals depending on market changes by taking paths on a Kanban roadmap rather than focusing on a static overall project schedule. The Kanban Method offers a management strategy that allows teams to become self-managed while ensuring that the decision-making process is straightforward and coherent. It is just as vital to adapt quickly to demand as to respond to developments in the industry. The use of Kanban allows you to create the comparative edge of being renewable.

- Improved collaboration: Every day the people work on this. By promoting cooperation, Kanban helps the squad. All staff members are expected to actively collaborate together and give their input on how to develop existing practices – from planning regular priorities and daily stand-up meetings to determining the path the company takes in strategic reviews. The multiple Kanban meeting ensures the sharing of knowledge and brainstorm ideas and collaboration between stakeholders in different fields.

- Better atmosphere of the business: Good engagement between partners, stakeholders and clients contributes to a stronger moral and inclusive atmosphere of the organization. The views of everyone are valuable and significant. Independence and initiative are encouraged to develop their ingenuity and skills. Team members. A Kaizen culture is defined as an organizational culture in which all workers are constantly concentrated on maximizing efficiency, competitiveness and customer loyalty.

- More forecasting: When are you happy, the number one question posed by product managers? Implementing WIP limits and guaranteeing that the assumptions of the Little Law are followed maintains the method as a secure framework. The number of tasks pulled into should be about the same as the rate of tasks. A reliable structure, which makes data-driven choices possible, is a predictable system.

> ## ➢ **Limitation of Kanban Methodology in Web based Project**

- Cannot use Kanban as an individual instrument. This technique cannot only be implemented but can be fashioned with other processes and structures of an organization such as JIT, making the systems noticeable and organized etc.

- When duties are continually moved between the Kanban board columns, it becomes impossible to determine exact timetables for tasks or events. This is because Kanban only works on a pull production device as a signaling port.

- Kanban is not sufficient for complex conditions. Given that the Kanban system takes on the plans to a certain degree predictable and reliable, in industries where operations are not static, they may become ineffective.

- If too many operations or functions are interrelated in a method, Kanban can become very difficult to implement. This is because these processes improve the likelihood of goods and skills being transferred between the various roles too much and increase the challenge of maintaining the speed of each operation.

- The device implementation will lead to low quality results. Kanban serves as a surveillance structure to smooth the workflow. If work for the customer or the business is unsatisfactory, rework would be required, which may make the matter harder as it would take more time and money to get finished. (Brechner, 2015)

## 9. My Research & methodology

### ➢ Introduction

Research on Project management techniques for web-based projects is incredibly valuable in IT projects as it enables researchers to understand how complex projects function. For IT projects, substantial thinking, investment and initiative are required to professionally assess organizational usefulness. Sponsors are an important part of an organization, since they are the approved entity for intervention and for addressing problems outside project managers' influence. Data Analytics is an emerging area which integrates expertise from a variety of fields such as software development, data management and statistics. Most projects generally aim at identifying associations and causal links, classifying and forecasting events, identifying trends and anomalies and inferring probability, interest and feeling. Big data, also used as a data science sub-set, encompasses the end-to-end method of gathering, processing, and reporting analytical results. This area covers broad and minor data collections. Data are a similar field.

Sadly, there has been little published about the right way for a community to work together to implement a web project. A clearly defined, recurring process will allow project teams to address a variety of obstacles, including the awareness that they need to be a stakeholder, pick a suitable data architecture/technical infrastructure, assess sufficient analytical strategies and verify outcomes. These activities will still also be addressed without a well-defined plan, but the team would not forget one stage or benefit from their own and others' experiences, leading to a less successful process.

This research discusses the influence of various methodologies for the project data sciences, using project managers as participants, in a controlled experiment. The analysis is intended to establish whether one approach is superior to another (In terms of the right approach for a web project, a team can use). In particular, two study questions will be addressed:

**1) How to compare various project methods?**

**2) Is one methodology in project management better than other approaches?**

## ➢ Web Development Experiments

Empirical study in information engineering must meet three challenges according research :

(1) Project managers vs. expert

(2) Environments in laboratory vs. Real life

(3) Individuals vs. groups

**Project managers vs. expert**: Project managers generally are used for experimental software development. For example, in 87% of the studies studied over a 10-year period, project managers were used as subjects However, it was noted that the confusion impact of proficiency is simply misrepresented in the "project managers vs expert," and that in reality performance gaps are far more significant than status differences. It was however noted that "project managers vs specialist" are far more important than discrepancies in rank than misrepresenting the false impact of qualifications and performance differences. Therefore, project managers at the master's level with

a total of three years IT experience will always make better choices than those with a minimum of experience. Furthermore, if project managers want to compare experimental environments, the fact that all project managers have about one degree of schooling leads to improved statistic properties will potentially minimize their heterogeneity. Furthermore, although project managers do not have the expertise of practitioners of computing, they can be seen as experts of the next generation and are suited to many software creation experiments.

**Laboratory environments vs real life:** The compromise between realism and autonomy is one of the difficulties in designing a software development experimental design. A long-lasting mission, though, will increase realism while retaining experimental control by making more and practical tasks.

**Individuals v. groups:** While there are several methods of evaluating an experimental effect, most generally effective work, time-to-work, perceived tool/methodology and approach efficiency are relevant for the most regular studies.

If you want to compare various methodologies to increase the overall success of a squad, however, so assessing and comparing the efficacy of the different teams is important. For example, social psychologists and psychologists have studied teams and their success for decades and have various models to characterize and explain team behavior and performance.

The Hackman's model for team efficiency, narrowly defined and the use of team process variables seems to be one of the most applied norm models and suitable for its role in defining team effectiveness factors. In short, this model reflects on the variables involved (such as organizational context and group design), process factors and the moderation of outcomes (including job performance, the team's ongoing capacity to work together and the actual team members' satisfaction).

## ➤ Methodology

We also carried out an experiment comparing four different workflow methodologies to explore the influence of different approaches to project management. In specific, project manager teams working on one of 4 different process methodologies at the master's level data science focused on a semester long project.

We have taken advantage of Hackman's model to test the various project methodologies. Specifically, the input variables (like the corporate framework and group design) were maintained continuously, and the procedures employed by the different departments were different.

As seen in Figure 1, our model for team effectiveness is based on the results of Hackman which includes mission results, team capacity to continuously work together and individual team members satisfaction.
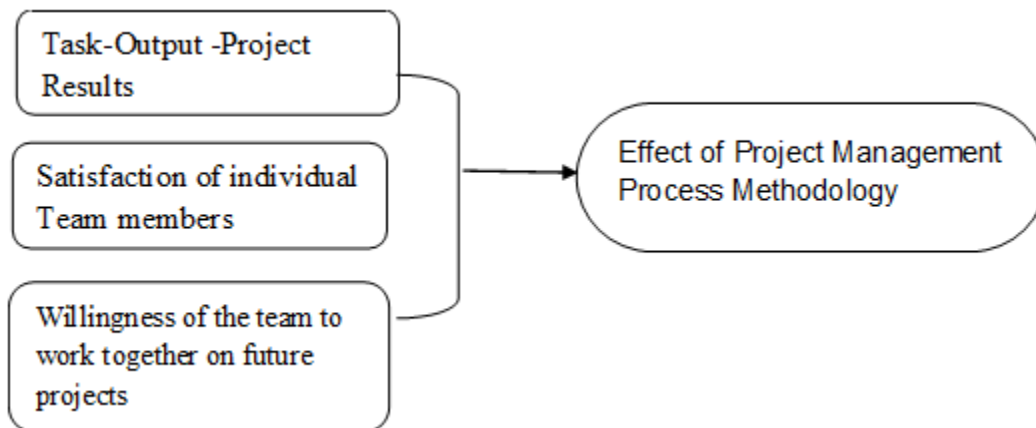


Fig. 7 Model for team effectiveness (inspired by google)

Table 1 provides an overview of how we have implemented our method assessment model, based on this model. Notice that we have monitored the teams in the course of the semester (i.e. monitoring of teams at work) in order to set the framework for our results and attempt to identify potential more leaders in team performance, in addition to the variables established in our process assessment model.

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| Key Scales | How to Be Defined |
|---|---|
| Team desire to collaborate on future projects | End of term project Survey |
| Satisfaction of each team member | End of term project Survey |
| The outcome of the task | Expert Jury |
| Dynamics of the teams and state of the project | Observation and participant |

Table 1: Performance of the measurement team

As shown in Table 1, we used different methods of data collection to test team performance, and hence to solve our research issues in line with Eisenhardt. Our approach was, in particular, a hybrid methodology of study incorporating qualitative and quantitative approaches. Our qualitative analysis included insights and semi-structured interviews with the project teams.

Those interviews based on the status and complexities of the project. A systematic survey was evaluated during the quantitative process of our study and circulated to all participants at project completion. The remainder of this section contains more detailed explanations of the experiment first by identifying the participants of the research and then the experimental project.

A summary of the various methodologies of the procedure (i.e. the conditions of experiments) is followed and what is kept constant in the community.

## ➢ **Topics for Project Managers**

A total of 85 project managers were involved. 40% of the project managers were female, while over 75% had prior IT experience in the project managers. In reality, most project managers, usually within the IT sector, have two to five years' work experience. The project managers included in the study included various organizations. This was their initial introduction to data science for half of the project managers. The other half of the Project Managers had the same amount of expertise as the data scientist.

## ➤ Survey Description

As part of the study, project managers had to collaborate on a community project that began on the second week of the semester and lasted for a total of 12 weeks before the end of the semester. The final project constituted 25% of the incentive scale, which prompted the project managers to work on the project. This project was conducted via a common tool in both industrial and academic fields, the programming language of Python. Many traditional data science technologies is supposed to be used in analysis, including using machine learning algorithms, combined governance and geographical analysis.

However, Project Managers were not given clear guidance (on what analysis was to be done). The dataset was an updated version of an actual research survey dataset from a true hotel chain. The data was therefore not real but reflected the difficulties in the implementation of a web project. The data collection included approximately 1.5M consumer survey responses and was about 5GB in size. In total, the dataset contained 127 survey attributes.

Project managers have access to each dataset column summary. The characteristic included information about the individual answering the survey (e.g., home, are you a member of the award scheme, and if so, what rank are you at?), data more about accommodation (for example, location) and data about the customer who stayed at the hotel and responded to the survey Notice those values are blank in the dataset. This represented a common 'true life' difficulty of managing missed beliefs, when some of the studies posed more questions than others (i.e. separate surveys were done in different studies).

The project is designed to serve as advisors for the project managers and to review the wide range of data on their consumer surveys. The objective of each team was to identify and respond to "significant" concerns like how to comprehend how well different surveys are recommended.

Notice that none of the teams have clear questions/goals. Every team decided, for example, what to study and was dependent on how the team determined the usefulness of the data and the length of the project. Project managers examined the available data and reviewed potential research solutions with their customers to determine the relevant issues (or more accurately, a person acting as the client). The project managers had no access to the full dataset to model Project Managers operating with a larger organization but requested the "IT department" to obtain a subset of

data(i.e. which columns must be included, excluded and included). Returned findings in CSV format (for easy reading into Python data frame)

### ➢ **Circumstances of experimentation**

In the same weekly training workshops, all project managers got an overview of the core principles for web creation. The project managers were grouped into four laboratory groups, and 20 to 22 were project managers in each of the lab sections in addition to weekly training. Per portion of the laboratory even met on a weekly basis. The project managers in each section were split into teams of four to six project managers per unit of four teams. The weekly laboratory section discussed practical use of practical data analysis and project managers' time to focus on their project. There were a total of 16 teams, four teams in each laboratory. Each part of the laboratory was taught and employed a separate approach to collaborate as a team on the web development project. Therefore, each laboratory section was a separate experimental condition and between twenty and two project managers each experimental condition. The various experimental conditions are listed below.

## Agile and Scrum

The agile scrum approach used to build information applications has been used to change this methodology. The squad was told specifically to sprint (working break) for the last two weeks. The team collectively agreed what could be done during the sprint and at the conclusion of the sprint the final outcomes is "compatible." The project managers were also advised not to alter the research that needed to be performed for the sprint after the sprint (Any proposals and recommendations will be integrated into the preparation of the next sprint.). The team will ensure that all the targets of the sprint were completed in the 2 weeks for the sprint, and then meet again to discuss the sprint jointly and decide what to do in the next sprint. In particular, a sprint schedule meeting examined the "sprint backlog" for each sprint and then team members collaborated together to identify the objectives of the next sprint.

## Agile and Kanban

Agile and Kanban has combined a series of web development processes that are aligned with Kanban pipeline project management. Kanban was designed for lean production, but was implemented in a variety of areas, such as software development. The Kanban Board, where work can be readily seen and monitored, is a core feature of this technique. In particular, the Kanban Board's phases included planning (including market sense and data understanding), analysis (model/visualizing, test/validation) and deployment (sharing/communicating results). A maximum number of work-in-progress tasks were specified during each step, which could be "in this process." The team has identified a priority list of what to do using this setting (through high-level "user stories" such as linking weather information to our data previously collected). Then a task passed through the given process based on the number of simultaneous tasks permitted at each point. Reducing the number of tasks in one phase can allow the team to eliminate bottlenecks and function.

## CPM (Critical Path Method) and KaiKaku

CPM and KaiKaku has adopted the main steps in a traditional data project based on an industry standard (business understanding, data understanding, data prep, modeling, evaluation and deployment). In this structure, the team advanced as it was thought necessary to the various stages (or phases). The team could "loop back" as necessary to an earlier phase (e.g., additional data preparation) and could identify targets they considered beneficial. A bi-weekly update meeting to monitor status/problems was held at a nominal stage.

## Baseline (no established Methodology)

Project managers have not received any specific recommendations for the project management process in this situation. The teams then performed to their own taste, as they had on other team ventures.

➢ **Observations**

A few main subjects were identified in the analysis of the observations of the project management teams (as created during the updates of the project manager and in the observation of how their teams actually operated on the project).

These results are described below in each of the test conditions. These teams began analyzing quite early and appeared to neglect most of the analysis that helped other teams to appreciate consumer needs and available data. In other words, these teams normally jumped to "practice" (for example, analytics in Python), even though the customer still needed to be puzzled (ie. to grasp the criteria of the customer).

Furthermore, many teams didn't build well defined sprints and many even modified the schedule after a sprint. Partly because the team members could not adequately understand the process and partly because the team could not accurately assess how long tasks would be taken.

## Agile / Kanban:

In order to grasp the project status, the Agile Kanban teams appeared to quickly use the Kanban board. The teams generally knew the customer demands well. One team had a problem with the grain of the Kanban board assignments – they were a little too big. A new "Kanban board column" was developed by another team to handle / align the analysis on a smaller data set and how much to rely on larger scale. The first goal of the team was to focus on a minor data set (Code and validate smoother); however, the team proposed another column as they debated how to align work on the less significant data set with work on the greater dataset. This showed (to the observers) that the Kanban Board is used by teams not just to monitor but also to strategize how to prioritize work. In contrast to the more comprehensive board, activities were seen through the various phases of the study, certain groups followed a simplified board made up of 'not begun' and 'finished.' These groups displayed no substantial difference relative to the groups that retained the comprehensive Kanban Committee.

## CPM / KaiKaku

The teams spent the first four weeks learning the company needs and details, and the last time they coded (compared to the other process methodologies). They had a fair playing ground, or maybe even more, than the Agile Kanban teams (and much different than the squads with Agile Scrum). However, because they postponed the coding for the analysis, the teams didn't realize entirely the coding problems they were going to face when they began to do the analytics until much later on in the project.

## Baseline

Maybe the teams requested any advice from the coach ("what shall we do") as planned, but they were mostly relaxed without a well specified technique. Not unexpectedly, this project approach was similar to several others in other classrooms from a project manager's viewpoint. This is not shocking. The teams advanced over time to grasp the criteria and to use R to perform the analysis. The teams progressed. It turned out that the teams were working in a CPM / KAIKAKU-like methodology without instructions. They defined steps and made a number of iterations, in other words (loop).

## ➢ Project Results

Each project was evaluated separately by two professionals (on a range of 1 to 10, with 10 represents an excellent project). The ratings from both professionals were 0.7 in both projects and no project had a variation of more than one point between both the two reviewers (on the 10-point range). The project findings in each condition were pooled among the reviewers to evaluate the quality of the projects in different experimental conditions. As seen in table 2 above the other two experimental situations, the teams which used the CPM/KAIKAKU and Agile Kanban methodologies performed better. There was also a statistically meaningful difference, calculated by ANOVA, between groups. Agile Scrum was statically different from the Agile Kanban and CPM/KAIKAKU performance, in particular using the post hoc fishing test.

| Project Methodology | Range (between 1 to 10) |
|---|---|
| Agile Scrum | 6.5 |
| Agile Kanban | 7.8 |
| CPM KaiKaku | 8.4 |
| Baseline | 7 |

Table 2: Project Results

## ➢ **Project manager Study Reactions**

Toward the fulfilment of the undertaking, by means of an overview, the understudies were approached to concur or deviate (utilizing a 1 to 5 Score scale) to a few assertions. For instance, we investigated if the Project managers might want to work together on future activities. In this way, as demonstrated in Table 3 furthermore, talked about underneath, we examined the key measures of group viability noted already in Table 1.

| Proclamation | Methodology | Median Score (between 1 to 5 Score) |
|---|---|---|
| I would like to collaborate on future projects for this team if needed. | Agile Scrum | 3.4 |
| | Agile Kanban | 4.2 |
| | CPM KaiKaku | 4.3 |
| | Baseline | 3.8 |
| I am really pleased (in terms of the project) I have | Agile Scrum | 3.9 |
| | Agile Kanban | 4.3 |
| | CPM KaiKaku | 4.4 |
| | Baseline | 4.4 |
| This style of project management was close to the way I did previous community projects | Agile Scrum | 3.3 |
| | Agile Kanban | 2.5 |
| | CPM KaiKaku | 3.3 |
| | Baseline | 3.6 |

| Use of the project management system in my team was complex | Agile Scrum | 2.6 |
| | Agile Kanban | 3.1 |
| | CPM KaiKaku | 3.0 |
| | Baseline | 2.6 |

Table 3: Project Managers Perceptions

<u>Willingness to work together on future projects:</u> If a group was profoundly gainful however the Project managers never needed to cooperate on future undertakings, that would not be an alluring result inside numerous associations. Regarding the inquiry "I would need to work with this group on future tasks", Kanban and Fresh scored the most noteworthy (with, separately, a 4.2 and 4.3 score on a 1 to 5 Score scale). The most reduced positioned strategy was the Light-footed Scrum, with a normal reaction of 3.4, beneath even the Gauge strategy. Note that there was a genuinely huge distinction between bunches as controlled by ANOVA. In particular, utilizing the fisher post hoc test, Deft Scrum was statically unique in relation to both Deft Kanban and Fresh techniques.

<u>Satisfaction of individual team members:</u> The Dexterous Scrum measure again positioned the most reduced, with a score of 3.9 (The remainder were given 4.3 or 4.4 score). While intriguing, there were no genuinely huge contrasts between bunch implies as dictated by ANOVA. More examinations will help decide whether this distinction is statically critical. Convenience: The Coordinated Kanban approach was answered to be the most not quite the same as what the understudies had encountered previously, in light of the project manager reactions to the assertion "This undertaking the board technique was like how I have done past bunch projects", in which Light-footed Kanban approach was a lot of lower than the other procedures. Note that, utilizing ANOVA, these outcomes were statically critical in that Spry Kanban was statically not quite the same as both Spry Scrum and the pattern. Our perception of project manager groups during the venture persuaded that a capacity to handily embrace and use the interaction may be a vital factor to consider. Thus, this was investigated on our post undertaking review. Maybe as anyone might expect, the Kanban strategy gave off an impression of being confounded for colleagues to utilize (in light of the reaction to the assertion "It was confounded to utilize the undertaking the executive's strategy inside my group"), as was the Fresh strategy. Notwithstanding, because of the fluctuation in the member answers, none of the results were genuinely extraordinary regarding how convoluted it was to utilize the strategy.

Ease of Use :  The Coordinated Kanban approach was answered to be the most not quite the same as what the understudies had encountered previously, in light of the project manager reactions to the assertion "This undertaking the board technique was like how I have done past bunch projects", in which Light-footed Kanban approach was a lot of lower than the other procedures. Note that, utilizing ANOVA, these outcomes were statically critical in that Spry Kanban was statically not quite the same as both Spry Scrum and the pattern. Our perception of project manager groups during the venture persuaded that a capacity to handily embrace and use the interaction may be a vital factor to consider. Thus, this was investigated on our post undertaking review. Maybe as anyone might expect, the Kanban strategy gave off an impression of being confounded for colleagues to utilize (in light of the reaction to the assertion "It was confounded to utilize the undertaking the executive's strategy inside my group"), as was the Fresh strategy. Notwithstanding, because of the fluctuation in the member answers, none of the results were genuinely extraordinary regarding how convoluted it was to utilize the strategy.

Impression of What Functioned admirably: In dissecting the more open-finished inquiry of "what was working well", as demonstrated, the level of understudies that referenced "group coordination" or "collaboration" was significantly unique across the extraordinary exploratory conditions. Specifically, 58% of the understudies utilizing Spry Kanban expressed that their group functioned admirably together (with no brief about cooperation or how the group was cooperating). Lithe Scrum and the Gauge were a lot of lower (19% and 15% separately). Note that different remarks about what functioned admirably (and the remarks about what should have been improved) commonly cantered around the real task (ex. "give information toward the beginning of the semester" or "give all the more obviously characterized necessities"). This last remark features a distinction when contrasted with other, more normal, project manager projects, in that the understudies were given the informational collection and a business champion that wanted to get "information from the information", however the understudies didn't get a bunch of explicit headings, for example, which AI calculation to use to acquire understanding into a particular lodging characteristic that may have driven consumer loyalty.

| Methodology | % of studies citing "group" or "management" | Diplomat Cites |
|---|---|---|
| Agile Scrum | 19% | "Team results, group debates," "We're so glad about what we did" |
| Agile Kanban | 58% | "I loved the project concept overall as well as the project approach " "The team collaborated well." |
| CPM KaiKaku | 44% | "Cooperation and collaboration ""We reflect on our objectives and have been able to communicate" |
| Baseline | 15% | "The scheme was consistently advanced and ultimately finished on schedule" |

Table 4: What Worked Well

## ➢ **Conclusion**

To address our first examination question (how one could look at changed venture approaches), we characterized an underlying model to assess diverse information science project the executive's systems. Figure displays a refined model which identifies four variables which can direct the evaluation of the different information research project procedures. True to form, the nature of aftereffects of a venture is a significant part for assessing projects. The eagerness of the group individuals to cooperate on future ventures and the fulfilment of the colleagues, are likewise key segments of the model. One aspect in the project was that using the technique was so normal.
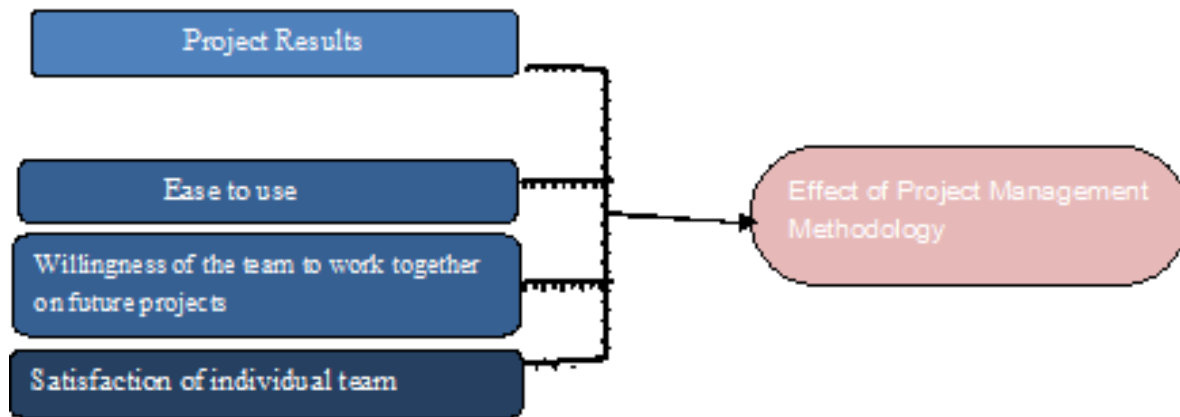
Fig.7 factors (Inspired by Google)

The aftereffects of our examination tended to our second research question (is one undertaking the board strategy better than different techniques). In our try, there were two techniques that were better than the others (Nimble Kanban and the Fresh measure strategies), with Kanban being somewhat better, because of Kanban's groups higher spotlight on collaboration (that was accounted for in Table 4). Maybe a piece shockingly, the Dexterous Scrum philosophy was in reality more awful than the Pattern condition (i.e., not giving the colleagues any measure strategy guidance). Why not Coordinated Scrum?

In the first place, it was a troublesome cycle for a group to completely use. Also, task assessment was very troublesome, so the colleagues didn't have incredible trust in what could be finished inside a run. Moreover, the strategy made understudies "bounce into the information examination" and not spend enough time understanding the information and the necessities of the customers. At last, maybe the approach was hard for understudies to comprehend and apply inside a information science project setting. For what reason was Lithe Kanban compelling? Maybe it was because of its way of life of constant improvement. In the end, it shows up Kanban assisted with project manager cooperation abilities and encouraged joint effort. It additionally seems to have a low hindrance to passage with no huge preparing required.

We can surmise this because of the way that even although the understudies noticed that the Kanban strategy was different to them, they appeared to embrace the Kanban strategy. For what

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reason was the Fresh model viable? It was a very characteristic method of leading the ventures: understanding, examination, and so forth and making circles/emphases if essential. It is likewise intriguing to take note of that the understudies without an appointed system began to merge into a Fresh like system, despite the fact that they were most certainly not furnished with a particular guideline.

> ## Summary

Web architecture is an evolving discipline with an important emphasis on the improvement of data analysis techniques. Far less emphasis has been put on how people can collaborate on a web project together. In this article, we report the results of an experiment which contrasts four different methods of managing and organizing a web project. First, we present a paradigm to compare various methodologies in project management and subsequently report on our experiment findings. The experiment's findings show that there are major variations depending on the approach used, with the most efficient and unexpected methodology for an Agile Kanban, the least effective methodology for an Agile scrum.

## 10. Descriptive Statistics analyses

In brief, Descriptive statistics certainly explain and useful shapes for dataset attributes by including a short summary of the samples and data steps. Centre scales, the mean, the medium, and the mode used on almost all mathematical and computational forms, are the most recognized forms of statistical definitions. The calculation of averages by addition of all the facts in the data set and then dividing by the number of facts in the set. The data set mode is the most frequently occurring number, and the median is the data set's middle number. It is the amount that lies between the upper and lower limits of a data set.

Descriptive figures sum up and arrange data set characteristics. A compilation of data is a survey or population series of responses or observations.

The first step of predictive analysis after data collection in quantitative studies is to classify attributes of responses such as the average of one variable (e.g. PM techniques) or the association of two variables (e.g., PM techniques and time or cost).

The next move is inferential statistics to help you determine if your results validate, contradict and generalize your theory for a wider population. Descriptive figures are classified into many categories.

Descriptive statistics are classified into three types:

- The frequency of each value is represented by the distribution.

- The central tendency is concerned with the value averages.

- The variability or dispersion of values refers to how uniformly distributed the values are.

Research example:

we want to study the popularity of different Project management methods by Project manager. We distribute a survey and ask participants how many are faced issues for time, cost, quality and recourses of their project as Project sponsor, Project managers and Project team members

1. Faced trouble to start the project
2. Available Sufficient resources to complete the project
3. Satisfied with the progress of the project
4. Possibilities of completing the project within the scheduled cost
5. Possibilities of completing the project on the scheduled time

Simple frequency distribution table

For the variable of Methodology, you list all potential answers on the left-hand column. You count each response to the quantity or fraction and show the number in the column on the right. From the below answers, you can see that CPM and KaiKaku are mostly Difficult in the study.

| Methodology | Number of Participants | Difficult Factors |
|-------------|------------------------|-------------------|
| CPM | 25 | Time |
| KaiKaku | 27 | Cost |
| Scum/Agile | 12 | Recourses |
| Kanban | 16 | Size |

Table 5 : Estimation of data range

## ➢ Measures of central tendency

Core inclination measures approximate the data set's middle or norm. The mean, median and fashion are three average methods.

Having taken the first 6 responses of our survey, we shall show how to measure the mean, median and mode.

The MEAN or M is the highly utilized method for finding the average.

Only add all of the answers and divide the total number of responses to find the mean.. N is the cumulative number of replies or comments.

• MEAN number of Project Manager Face Difficulties due to 4 important factors:

Data set                              25 ,27, 12 ,16

Sum of all values              25 + 27 + 12 + 16 = 80

Total number of Techniques   N = 4

Mean   Divide the sum of values by N to find M:  80 / 4 = 20

The median is the precise value in the center of a data set.

Any response is worth the medium order from the smallest to the highest. The center number is the median one. If two numbers are in the center, find your MEAN.

• Median number of Project Manager Face Difficulties due to 4 important factors:

Ordered data set        12,16,25,27

Middle numbers        16

Median                16

Mode is the most famous or most common answer value. In a data set may have no mode, one or many modes can be used. In order to find the fashion, order the data from the lowest to the highest and find the most frequent answer.

• Mode number of Project Manager Satisfied with the progress of the project:

Ordered data set        12,16,25,27

Mode   This data set have no mode because if we find the most frequently occurring response: 0

## ➢ Measures of variability

Variability measures give you an idea of how the response values are distributed. Each range, standard deviation and variance reflects various aspects of spreading.

Range: This range gives you an indication how different the serious reaction score is from each other. Just remove the lowest value in order to find the range.

Range of Project Manager Face Difficulties due to 4 important factors

Ordered data set:  12,16,25,27

Range: 27 – 12 = 15

## ➢ Standard deviation

The average variability is the normal difference(s) in your dataset. It indicates how far the average score is, in average. The higher the standard difference, the more variable the results are collected. In the next steps you can find the standard deviation:

List and find the MEAN of each score.

• Subtract the MEAN of each score to obtain the MEAN variance.

• Each of the deviations is square.

• All squared differences add up.

• Divide N-1 between the number of the squared differences.

• Find the number's square root.

| Raw data | Deviation from mean | Squared deviation |
|---|---|---|
| 25 | 25 - 20 = 5 | 25 |
| 27 | 27 – 20  = 7 | 49 |
| 12 | 12 – 20  =  - 8 | 64 |
| 16 | 16 – 20  = - 4 | 16 |
| M = 20 | Sum = 0 | Sum of squares = 154 |

- 154/4 = 51.33
- √38.5 = 25.66

From above Calculation s = 25.66, On average, every score is 25.66 points different from the MEAN.

## ➢ **Variance**

The variance is the average of the average square deviations. Variance represents the extent to which the data set contains distributed. The more the data is diffused, the greater the difference between the MEAN and the mean.

Square the standard deviation and find the variance. The difference symbol is s2.

s = 25.66   and  s2 =  658.60

## ➢ **Descriptive data univariate**

The emphasis is on one variable every time in various descriptive statistics. Data from each variable can be examined separately using various distribution measurements, central trend and distribution metrics. To measure these efficiently, programs such as SPSS and Excel can be used.

Project Manager Face Difficulties due to 4 important factors

| | |
|---|---|
| N | 4 |
| Mean | 20 |
| Median | 16 |
| Mode | 0 |
| Standard deviation | 25.66 |
| Variance | 658.60 |
| Range | 15 |

Unlike the median or mode, if you just use the MEAN as a metric of core inclination, the impression of the data set's "center" can be distorted by outliers.

Similarly, although the spectrum is vulnerable to extreme values, you can also include the standard deviation and variance to get conveniently comparable measurements of distribution.

# 11. Findings and Analysis

## ➤ Multivariate regression analysis

Multivariate regression is a monitored algorithm in machine learning with many data variables. A Regression is a multiplied regression expansion of one dependent variable and many independent variables. We attempt to estimate the output on the basis of the number of separate variables. Multivariate regression seeks to define a formula that can describe how variables concurrently react to changes in others.

## ➤ Multivariate Regression Phases

The feature collection and feature engineering, feature normalization, selection of the loss function and hypothesis, setting parameters of the hypotheses, minimizing the loss function, evaluate the hypothesis and creating the regression model are all steps in the Multivariate regression study.

- Function Selection - Functional selection is an essential step in a multivariate regression. The selection function is also known as selection vector. It is essential that we choose meaningful variables to improve model construction.
- Features standardization - We need features to be size, since they preserve general distribution and data ratios. This leads to an effective review. You may also adjust the meaning of each function.
- Select loss and hypothesis function – If an error happens the loss function will estimate. This means that the estimation of the hypothesis is far from the true values. The expected value of the feature/variable is here the hypothesis.
- Set the parameters of the hypothesis - The hypothesis parameter must be set to reduce the role of failure and estimate well.
- Minimize loss function – A loss minimization algorithm in the dataset has to be used to minimize a loss function to better change hypothesis parameters. It may be used for further operation after the damage is minimized. Gradient descent is a simple loss minimization algorithm.

- Test the hypothesis function- It is important to validate the hypothesis function as it forecasts values. This must be checked on research results after this is completed.

### ➢ Data set and project purpose

This report includes details from 100 project management representatives, 30 project supporters, 10 project managers and 60 project team members. The data includes the time, expense, precision, scale and resources required to apply the techniques for project management. In this data set the determination factor (R2), which calculates the fit consistency of the regression line, is just 51.5 percent, which is very lazy, as only tools (Table 1) are used to predict weight. So we begin by using all of the above metrics and then perform a number of different regression tests, which will inevitably limit the right methodology for project management. The performance of the techniques would be classified as the variable based on time, cost, accuracy, resources and project size.

### ➢ Analysis of data

Data analysis is a method to inspect, disinfect, convert, and model data in order to find knowledge that is useful, to inform assumptions, and to facilitate decision-making. Data analyzes have many dimensions and methods and cover many strategies under different names and are used in many areas of industry, research and social science. Data mining plays a major role in taking more scientific judgment and allowing companies to work more efficiently in today's market climate.

### ➢ Determination of the right methodology for project management

### ➢ 1st statistical model analysis

Project management technique = $\beta1$ (Kanban) + $\beta2$ (KaiKaku) + $\beta3$ (CPM) + $\beta4$ (Agile) + $\varepsilon i$
However, we have observed five variance inflation factors (VIF), time, expense and exactness; capital and the complexity of the project have been greater than the others, indicating that the model is multicollinear. The coefficient of determination, $R_2$ is nevertheless quite large (97.6%). The fitting of the data is really nice for the project management strategies predictive model. Our objective is subsequently to exclude multi-linearity.

- **Best Subsets**

The $C_p$ is 4.7 given the vector number of 3 (K=4) using the Optimal Sub-sets Regression. Consequently, the first new predictive weight model has been performed as follows, minus two variables:

Project management technique=$\beta 0$+ $\beta 1$ (Kanban) + $\beta 2$ (KaiKaku) +$\varepsilon i$

## ➤ 2nd statistical model analysis for 2 project management strategy predictors Regression

Use Minitab to evaluate the second statistical model after two predictor variables were omitted after the strongest subset regression was discovered. Because of this Minitab regression equation, the R square is only 97.6 percent, which looks nice. But, the VIF value of KaiKaku (13.208) is much greater than the other variables. For this modern predictive model, there was still a multi-linearity issue. The prediction model had to be more developed.

We concluded that the variable Kanban was the biggest P value of 0.401, supplied by the first step-wise test, after three separating step-wise tests. In the third stage evaluation, there were no p-value variables. So the multi-linearity problem had to be resolved and a stronger predictive model had to be identified.

- **Pearson Correlation Test**

In addition, we used the Pearson Correlation Test in Minitab to consider the multicollinearity of the third predictive weight model. The research showed that Kanban and KaiKaku had correlation coefficient 0.927. There is a high correlation between Kanban and KaiKaku.

## ➢ Review of Coefficients of Best Regression

We suggested taking out one of the two variables after reviewing the test of Pearson's correlation and identifying that Kanban and KaiKaku were strongly correlated. We used the regression analysis to identify which of our equations could be excluded.

We used the Durbin-Watson (DW) statistics to show the freedom of the bug, to prove that it does not have a serial association. We find that the DW was 2.00286 with the use of Minitab, which is nearly 2 confirming the rational null statement of ¨(′μ-1=0). The two hypotheses have now been fulfilled.

We used Minitab for the estimation of the best regression equation for project management from these 4 chosen variables with the provided Study of Variance (ANOVA) table by Minitab. The verification for the hypothesis is:

H0:β1=β2=ßen3=β4=0

H1: One of the β at least is not zero.

The F value is calculated by the MEAN regression square and the average error square. As the measured F=1518.51 is larger than 1.8, the null hypothesis is rejected and the regression at a relevant amount of 5 percent is inferred.

In addition, the graphical analysis seen in Figure 3 was checked. We found that, with one important point, the remaining model against the fitted values is stable. This shows that the model is rational. In view of the exceptional observer performance, only 6 observations within the whole model gave large leverage of the X value. In addition, for the second model, we have calculated a similar regression study, exited KaiKaku rather than Kanban, and found very similar effects. The discrepancy between the two project management strategy predictive models is that the Kanban's VIF is almost 10; nevertheless, the R is 0.1% higher.

| Project management technique = - | 105 + 1.02 resources | | | |
|---|---|---|---|---|
| Predictor | Coef   SE Coef | T | P   VIF | |
| Constant | -105.011          7.539 | -13.93 | 0.000 | |
| height | 1.01762   0.04399 | 23.13 | 0.000   1.000 | |

Table 1: Regression (project management technique vs. resources)

$S = 9.30804$      $R\text{-}Sq = 51.5\%$      $R\text{-}Sq(adj) = 51.4\%$

| Residual Error | 495 | 2593.9 | 5.2 |
|---|---|---|---|
| Total | 506 | 90123.3 | |

Table 2: ANOVA (for the 1st best regression equation)

| Residual Error | 495 | 2561.9 | 5.2 |
|---|---|---|---|
| Total | 506 | 90123.3 | |

Table 3: ANOVA (for the 2nd best regression equation)

## 12.   Review and recommendation

We also extracted optimal linear regression function by implementing regression analysis, best subsets, and step by step statistics of Durbin-Watson (DW) and Pearson correlation test. We suggest multivariate multi-linear regression research like surface reaction models for more data analysis.

In software development teams, Kanban is very common because it facilitates real-time coordination and accountability of assignments and liability distribution. These two items are really necessary for any app or web creation project to be finished promptly. Projects are categorized into campaigns, epics and supplementary user story utilized to accomplish the final projects.

Since initiatives by Kanban have the greatest effect on any project, the researcher analyzes their benefits as an agile technique for teams who use Kanban. Kanban programs offer input and allow a team to guide a project. Kanban initiatives are then used to shape the plan for a web development project utilizing a team. This could be an accurate order for a website to be created and introduced. If the initiative is to deploy the website by a specific deadline, for example, epics promoting the key initiative should be created to remind the team where each project component needs to be done.

Initiatives from Kanban project management teams will make a project the highest value and encourage them to concentrate first. A team may then obtain a website as soon as possible from the web creation timeline. Anything else that at this moment is not necessary or urgent has to be completed later. Stuff like internet connectivity, repairing broken functionality such as authentication and faulty deployments are all critical and should be fixed before any mistakes can be overwritten or new features can be introduced.

It maybe IT to communicate the method framework to be followed for team members in collaborating on larger initiatives. If the project is large enough, only one epic project can be divided into Kanban initiatives with a single team member, or an entire team. Each member of the team will see whether they function individually or in a team, the activities for which they are accountable while using Kanban. This assignment of duties and the ability to see who is responsible for what Kanban software is about.

It takes a lot of time to decide on what a developer wants to work with. Using Kanban initiatives, a developer already knows what he is to do daily or weekly, since it has been decided by the team leader or manager. This reduces the time spent before deciding, allows the developers to concentrate on their work and helps them to do much more.

Since Kanban initiatives set the overall topic of the project, the developers add it without evaluating it when a new feature that enhances the project is presented. This simplifies and saves a lot of time the feature add-on process.

The four types of projects are suitable for KaiKaku techniques. They are,

If something is innovative locally, that implies it is unique to the installation, even though it isn't a new business idea. Intensive capital implies that either front or over time it would be quite high. This sort will also be more like a modern production plant computer. The computer is unique to the facility, even though it is also seen in other businesses. Of necessity, modern computers would normally be very pricey.

The termination of the operation would end in reasonably limited costs. A modern technique for facilities such as Lean or Six Sigma will be seen as an example.

The assembly line will offer an overview of the past of anything fundamentally new in development, although it was also a capital-intensive one at the moment so something had to shift fully. Naturally, the improvements have been more than paying for themselves over time.

Radically creative & near service – this would be a project not spending capital, but transforming the way things are performed in the whole sector radically. KaiKaku projects would often be big but too ambiguous to help decide when a KaiKaku project is considered and when it can be a Kaizen project. Any ventures that end in a 20% or more change are called KaiKaku as a good law. If the shift is below 20%, it is generally called Kaizen.

Naturally, versatility may be offered in this. Companies are able to mark each project however they wish, but they are commonly understood to meet guidelines. The facilities should usually regard this sort of stuff as an anomaly rather than the norm rather than actively aiming at tactically creative or even big local ventures. Naturally, as a big potential to change occurs, steps can often be taken promptly to better optimize the chance. However, it is troubling that businesses may get away with minor subtle (Kaizen) improvements, which can be very important when taken together. KaiKaku ventures are normally much smaller than Kaizen but they are not less important for developing the facility in the long run.

The technique for routine projects and complex projects with the likelihood of a minimum improvement in the delivery period of activities is considered to have been established. In more chaotic programs, CPM sacrifices its utility. A vital route imitates incidents and actions in an integrated network. Activities are turned into "nodes," Archways and lines between the nodes appear like the beginning and the end of the operation.

After all there are several moving pieces in a web development team, and each web site is different. There will be more emphasis on content creation and pictures on a simple template platform, while a sophisticated e-commerce site uses a team of professional engineers, designers and SEM specialists to create a lovely, functional web site that is highly convertible. It is important to have everyone on the same page with so many staff members collaborating together to deliver a smooth end product. Web software teams are used for efficient team collaboration by two main development methodologies: Scrum and Agile.

As a sequential and static creation phase, Scrum tumbled through several falls. The Agile framework has been established in reaction. Agile is gradual rather than linear. An agile teams are

operating on 'sprints' which take a segmented amount of time for a week or two at most instead of starting at the beginning of a project and then flowing straight to the end, like a Scrum. Then review the project, provide input and make improvements. Developers collaborate together to arrange their regular schedules to hold each other up to date with the morning Scrum conference. This allows teams to communicate and advance on each part of the project, each with its own individual tasks that form a complete project.

For big, dynamic, innovative ventures, agile production is especially successful. If you are using an e-commerce or Magento platform, a unique function or a broad database portal, Agile could be the correct option. Agile is lighter than ever. It encourages improvements in vision or even progress of what exists through the creation of new knowledge. The Agile framework facilitates dynamic strategies, including the role of a SEM expert in developing material or design functionality to facilitate conversion. Agile decreases risk. Offer Agile an outstanding opportunity for those who respect openness as it facilitates transparent collaboration with our customer and project managers. Agile encourages consumer engagement. Many consumers feel safer understanding that they will help develop their vision as partners in the progress of the project. Agile has several faults that include navigation, which is the case with other systems. Agile would not for example, be the right solution for a tiny, basic website—the over-abundance of coordination may bog down a very significant project.

Agile encourages strong consumer engagement. Yes, Agile also has the advantages—but it can be a weakness. Scrum trusts in their expertise and places the project from start to finish, making the project expedient and operational. Scrum is a trusted company. The production phase will delay consumer engagement.

Agile can be influenced by creeping distance. As Agile is reactive in reaction to developments in industry and cool innovative concepts regarding upgrading, introducing new functionality and changes not only can slow down the production phase, but can also expand the complexity of the project. This shrinkage will raise initial forecasts of costs, decrease the priority of certain features and delay dates.
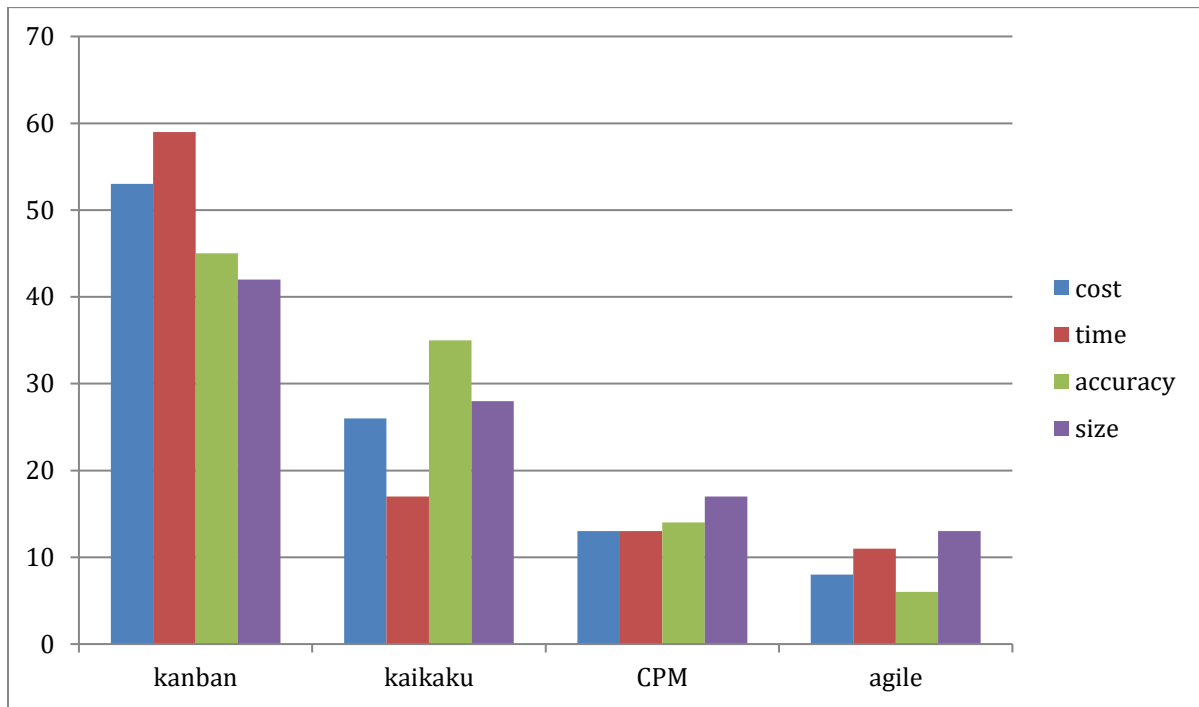
Fig 8: Efficiency of the project management techniques in terms of cost, time, accuracy and size

## 13. Conclusion

After evaluating the four types of project management techniques for web-based projects the researcher found that agile and Kanban are more suitable for the web based projects. Further analysis indicates that Kanban may be termed as the best project management technique for the web-based projects.

Once Kanban initiatives have been implemented, testers can begin work on this site as soon as developers are finished. This ensures that the testers don't get bugs long after a developer forgets the project or the features they add. This enables better cohesion between teams and faster product releases as the entire team can work on one project before it moves to another.

Better coordination between team members is also available. Because once team members understand the project's overall objective and have to see what others work on or know what they are going to work on, they just have to look at the Kanban board.

Kanban ventures save developers a lot of time by ensuring that the team operates together and developers take care of one job at a time. Which helps teams to finish tasks more efficiently? Kanban often facilitates straightforward contact by utilizing boards. Here a part of a team will see when everyone works and they don't have to ask. Contact requires about 30 percent of the time in most agile methodologies as team members inquire and transmit details to one another. Because teams need not do that in a framework in Kanban, they may take the time to focus on the project. An extra bonus is that the organization will generate a lot of profits and it needs less time to finish a job.

Kanban has revolutionized the agile functioning of teams: by breaking ventures into programs, epics and assignments, teams are able to accomplish IT projects even fewer than they traditionally required.

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## 15. Appendix

### ➤ Survey Questionnaire for the Project Sponsors

1. Did you face any trouble to start the project?

- Strongly Agree
- Agree
- Neither Agree Nor Disagree
- Disagree
- Strongly Disagree

2. Are your resources enough to complete the project?

- Strongly Agree
- Agree
- Neither Agree Nor Disagree
- Disagree
- Strongly Disagree

3. Are you happy with the progress of the project?

- Strongly Agree
- Agree
- Neither Agree Nor Disagree
- Disagree
- Strongly Disagree

4. Possibilities of completing the project within the scheduled cost

- Strongly Agree
- Agree
- Neither Agree Nor Disagree
- Disagree
- Strongly Disagree

5. Do you think that the project can be completed within the scheduled time?

- Strongly Agree
- Agree
- Neither Agree Nor Disagree
- Disagree

- Strongly Disagree


## ➢ **Survey Questionnaire for the Project Managers**

1. Do you have a clear idea about the project management techniques?

- Strongly Agree

- Agree

- Neither Agree Nor Disagree

- Disagree

- Strongly Disagree

2. Have you been properly briefed by the project sponsor about your area of responsibilities?

- Strongly Agree

- Agree

- Neither Agree Nor Disagree

- Disagree

- Strongly Disagree

3. Do you have the authority to make decisions?

- Strongly Agree

- Agree

- Neither Agree Nor Disagree

- Disagree

- Strongly Disagree

4. Do you find the project management technique appropriate?

- Strongly Agree

- Agree

- Neither Agree Nor Disagree

- Disagree

- Strongly Disagree

5. Are you happy with the progress of the project?

- Strongly Agree

- Agree

- Neither Agree Nor Disagree
- Disagree
- Strongly Disagree

## ➢ Survey Questionnaire for the Project Team Members

1. Are you properly informed about the project management techniques?

- Strongly Agree
- Agree
- Neither Agree Nor Disagree
- Disagree
- Strongly Disagree

2. Are you acquainted with the selected project management technique?

- Project Sponsor
- Project manager
- Both Project manager & sponsor
- Others
- None

3. Whom do you report about the difficulties to perform your job?

- Project Sponsor
- Project manager
- Both Project manager & sponsor
- Others
- None

4. Do you think the project will complete within the time limit?

- Strongly Agree
- Agree
- Neither Agree Nor Disagree
- Disagree
- Strongly Disagree

5. Can you properly communicate with the project manager?

- Strongly Agree
- Agree
- Neither Agree Nor Disagree
- Disagree
- Strongly Disagree