

Agile Methodology Overview

Introduction

Traditional software development models like the Waterfall model often suffer from late detection of defects, leading to inefficiencies. Agile addresses this by breaking the development process into short iterations, enabling early error detection and continuous improvement.

Key Benefits:

- **Improved Quality:** Faster feedback cycles allow for rapid issue resolution.
- **Business Value Focus:** Prioritizes high-value features.
- **Progress Transparency:** Clear visibility of project status.

Agile Manifesto: Core Values

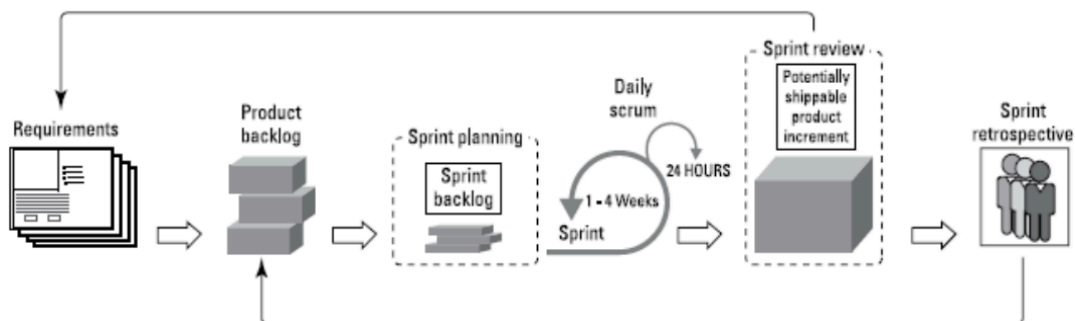
1. **Individuals & Interactions** over processes & tools.
 2. **Working Software** over comprehensive documentation.
 3. **Customer Collaboration** over contract negotiation.
 4. **Responding to Change** over following a plan.
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Agile Framework

Overview

The Agile framework emphasizes iterative development, divided into several sprint phases:

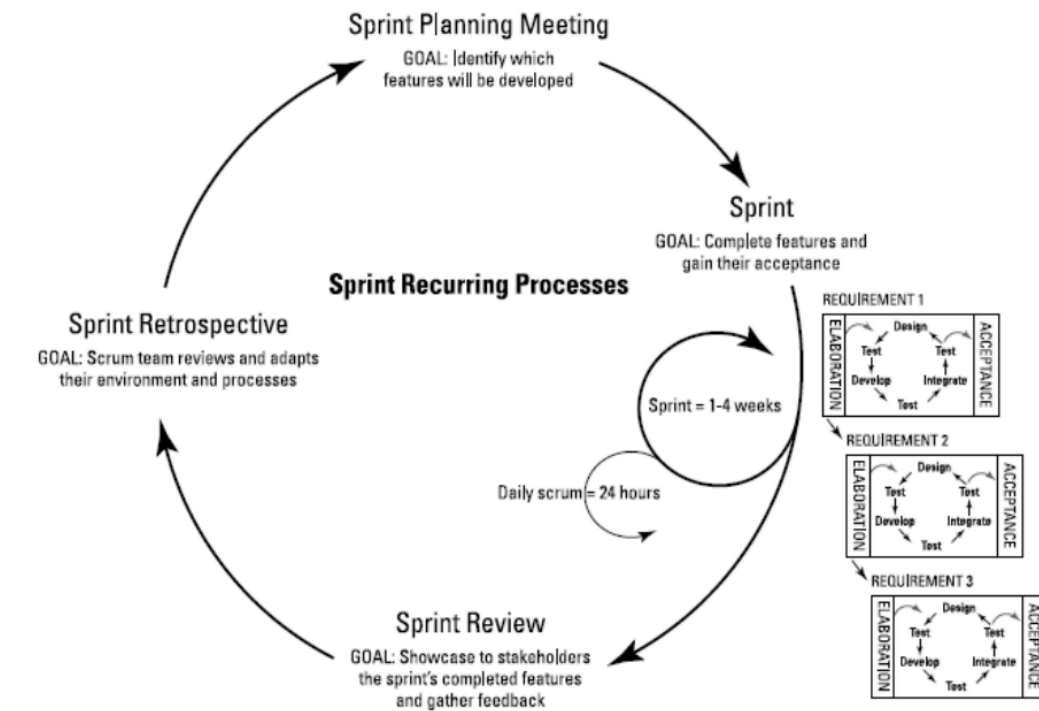
1. **Planning**
2. **Execution**
3. **Review**
4. **Retrospective**



Sprint Phases

Each sprint cycle includes the following phases:

1. **Planning:** Set goals, define user stories, and assign tasks.
2. **Execution:** Develop and test features.
3. **Review:** Demonstrate completed work.
4. **Retrospective:** Reflect and improve.

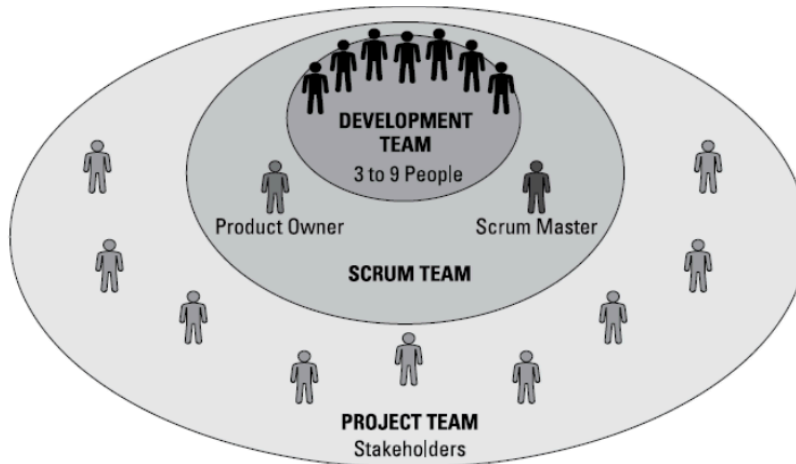


Agile Team Structure

Roles & Responsibilities

1. **Product Owner:**
 - Understands customer needs.
 - Prioritizes requirements.
 - Manages acceptance criteria.
2. **Scrum Master / Agile Coach:**
 - Facilitates the Agile process.
 - Communicates with stakeholders.
 - Removes roadblocks for the team.
3. **Development Team:**

- Multi-skilled members handling development, automation, continuous integration, and refactoring.



Product Release Planning

Steps for Release Planning

1. **Identify Stakeholders.**
2. **Establish Product Requirements** and add them to the roadmap.
3. **Prioritize Requirements** based on value, risk, and dependencies.
4. **Estimate Development Effort.**
5. **Define High-Level Time Frames** for releases.

ID	Story	Estimation	Priority	
7	As an unauthorized User I want to create a new account	3	1	
1	As an unauthorized User I want to login	1	2	
10	As an authorized User I want to logout	1	3	
9	Create script to purge database	1	4	
2	As an authorized User I want to see the list of items so that I can select one	2	5	Release
4	As an authorized User I want to add a new item so that it appears in the list	5	6	
3	As an authorized User I want to delete the selected item	2	7	Release
5	As an authorized User I want to edit the selected item	5	8	Release
6	As an authorized User I want to set a reminder for a selected item so that I am reminded when item is due	8	9	Release
8	As an administrator I want to see the list of accounts on login	2	10	
Total		30		
Velocity: 3 Points / Sprint		Sprint length 2 weeks		

Example: Home Loan Application

This application helps users check room availability, make bookings, and provide feedback.

User Stories:

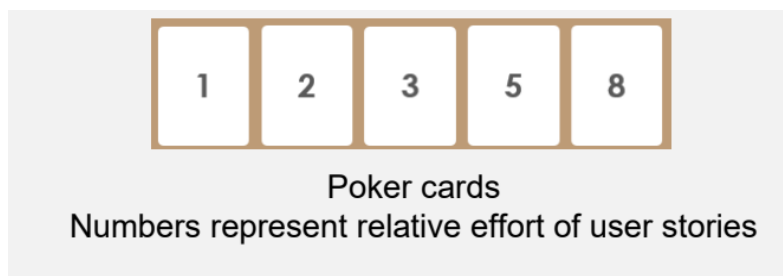
- Room booking
- Feedback
- Messaging from the hotel
- Booking history
- Loyalty points check
- Registration, login, logout

Features →	Apply	Evaluate	Approve	Pay EMI	Close loan
Release 1	Apply for loan - Single applicant	Check credit history	Verify repayment capacity	Pay EMI - Normal	Close after paying all EMIs
		Determine ability to pay			
		Calculate max loan			
Release 2	Apply for loan - Husband & wife jointly			Pay EMI - after skipping one	
Release 3	Apply for loan - Multiple people				Close by paying remaining amount (Foreclosure)
User stories					

Estimation Techniques

Estimation Poker

- Each team member selects a card representing the effort for a user story.
- Cards use the Fibonacci sequence (e.g., 1, 2, 3, 5, 8, 13) for better accuracy.
- If estimates vary, discussions refine understanding, and the story may be broken down further.



Example: Estimation of User Stories

- Register: 2
- Login: 2
- Logout: 1
- Room booking: 8
- Cancel booking: 5

ID	Story	Estimation	Priority
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1	As an unauthorized User I want to login	1	2
10	As an authorized User I want to logout	1	3
9	Create script to purge database	1	4
2	As an authorized User I want to see the list of items so that I can select one	2	5
4	As an authorized User I want to add a new item so that it appears in the list	5	6
3	As an authorized User I want to delete the selected item	2	7
5	As an authorized User I want to edit the selected item	5	8
6	As an authorized User I want to set a reminder for a selected item so that I am reminded when item is due	8	9
8	As an administrator I want to see the list of accounts on login	2	10
Total		30	
Velocity: 3 Points / Sprint		Sprint length 2 weeks	

T-Shirt Sizing

Categorizes user stories as Small, Medium, Large, or Extra Large based on effort.

When to Use:

- Effective for large projects with many similar user stories.
- Groups stories for quicker estimation.

Sprint Planning

Steps:

1. Set a **Sprint Goal**.
2. Select **User Stories** to develop.
3. Identify tasks for each story.
4. Estimate effort and assign responsibility.

Example: Sprint Plan for Hotel Room Reservation App

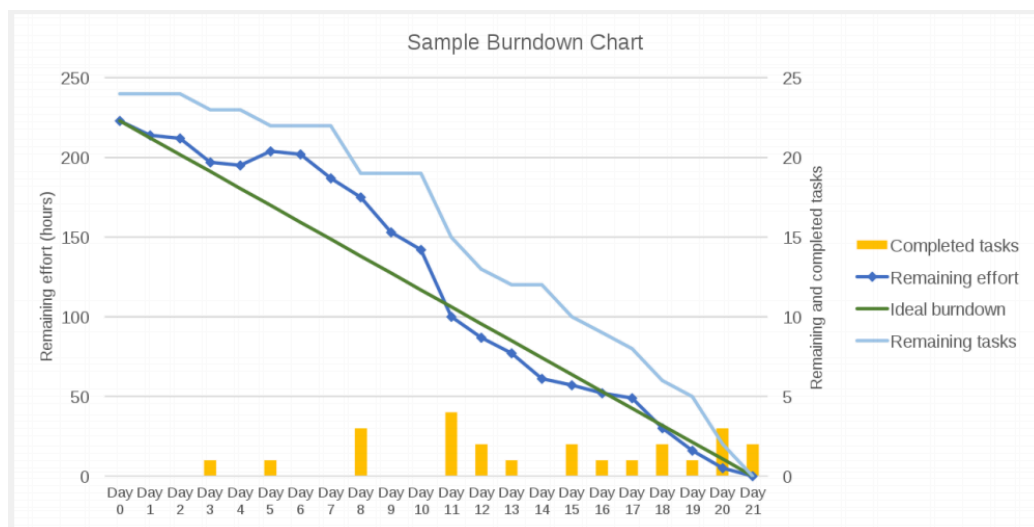
- **Goal:** Enable basic booking functionality.
- **Stories:** Register, login, room booking, cancel booking.

Feature	User story	Story point (Relative estimate)
Register	Enter user id and password: System registers the user	2
Login	Enter user id and password: System displays main page	2
Logout	System displays Login page	1
Room booking	Specify 'from' date & 'to' date: System displays rooms available and their price	3
	Pick a room category to book: System asks user to enter credit card #	1
	Enter credit card # and CVV: System makes the reservation and returns confirmation #	8
Cancel booking	System displays active bookings	2
	Select one of the bookings: System cancels the booking and credits money to your credit card account	8

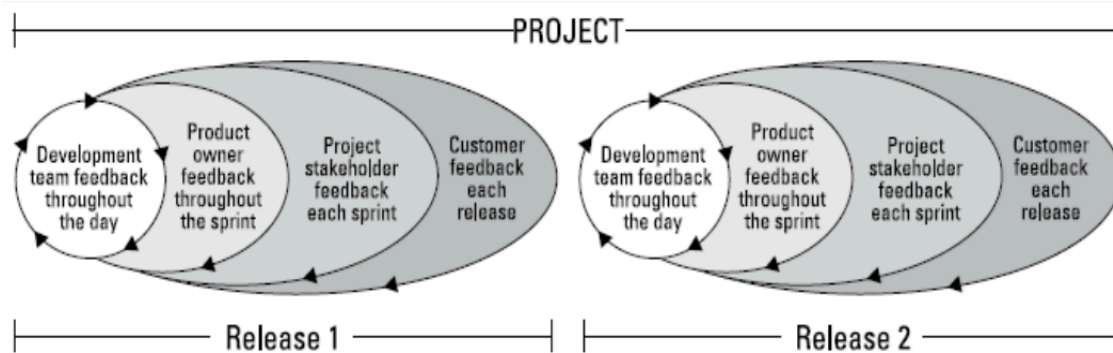
Progress Tracking

Tools & Techniques

- **Daily Scrum Meeting:** Discuss progress, challenges, and daily plans.
- **Burndown Chart:** Visualizes remaining work.

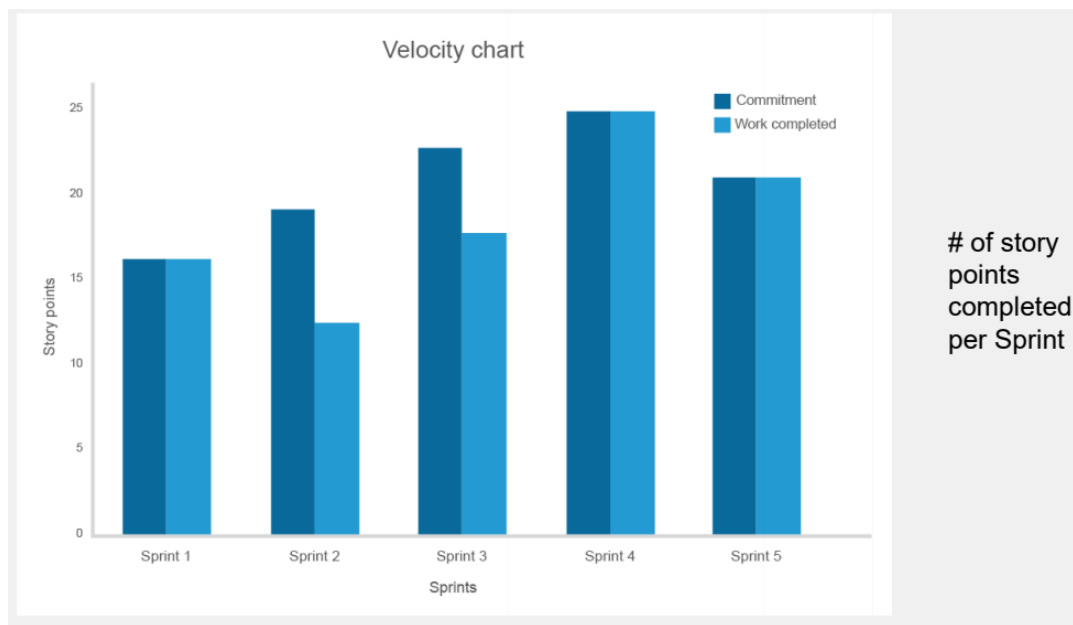


Feedback Cycle



Velocity Measurement

The number of story points completed per sprint.



Challenges in Agile

1. **Lack of skilled Product Owners.**
2. **Difficulty in fixed pricing and scheduling** due to evolving requirements.
3. **Frequent architectural changes.**

Case Study: Pharma Company - Inventory Management

Scenario

A Pharma company faced issues with outdated inventory data. Implementing Agile helped deliver functional increments in five sprints over 100 days, with notable improvements observed after the first month.

Solution

- Divided the project into short sprints.
- Delivered incremental features like stock alerts, order tracking, and performance reports.

Table 4 – Project XYZ Product Backlog.

Product Backlog – XYZ Project					
ID	User Case	Relevance	Estim.	How to Demonstrate	Remarks
1	Know the expiration date of the medicine batches in stock	200	5	Create specific screen for in stock materials, by batch expiration date.	Use, if possible, view by the inquire screen of current inventory, through customizing.
2	Correct inconsistencies in the expiration dates of the medicine batches in stock	180	3	Create manual update mechanism, with function segregation, to update inconsistent dates. Additionally, the possibility to block manual batch entry, at the end of the production line.	Review access profiles and add new functionality, only for Quality Manager.
3	Do not allow expiration date changes for medicine transferred among warehouses	160	2	Keep, during material transfer, expiration date of the original batch.	Review stock transfer transactions, and check associated profiles.
4	Validate the expiration date of medicine batches in stock	140	5	Complementary to ID #2. There must be a process of “auditing” of in stock materials, with a record of changes in the validity of the materials dates.	New program to be created, with restricted and controlled access execution.
5	Enable full inquire of	120	5	Develop new query	Verifv users who will

Table 5 – Project's main results.

Consideration	Explanation	Participant's Quote
Project Team	In the team's point of view, the fact that the results are being frequently delivered was motivating, providing greater satisfaction in seeing what was done and deployed. In addition, another important factor was the constant and real-time communication, which made a pleasant work environment (even in the early stages of the project).	According to the developer, "seeing what was done delivered generates greater satisfaction. In addition, constant communication and in real-time makes the working environment more pleasant."
Results (Deliverables)	With the project, the project team reported that changes in the scope were quickly addressed. For example, in agile management, customer reviews were made at the end of each Sprint, and any customer requirement non-compliance could be immediately addressed, not waiting until the end of the project, as it often happens in traditional approach.	In the Scrum Master view, "any change in the project scope is quickly addressed, and I consider this as a strength of the agile."
Customer	From the customers' point of view, they already receive something to use at the end of the first month. In addition, the Scrum approach helps to	As a customer mentioned, "within a month, you already have something and can start

Exercises & Solutions

Exercise 1: Hotel Room Reservation App

User Stories

- **Register, Login, Logout, Room Booking, Cancel Booking, Feedback, etc.**

Prioritized User Stories

1. Register
2. Login
3. Logout
4. Room booking
5. Cancel booking

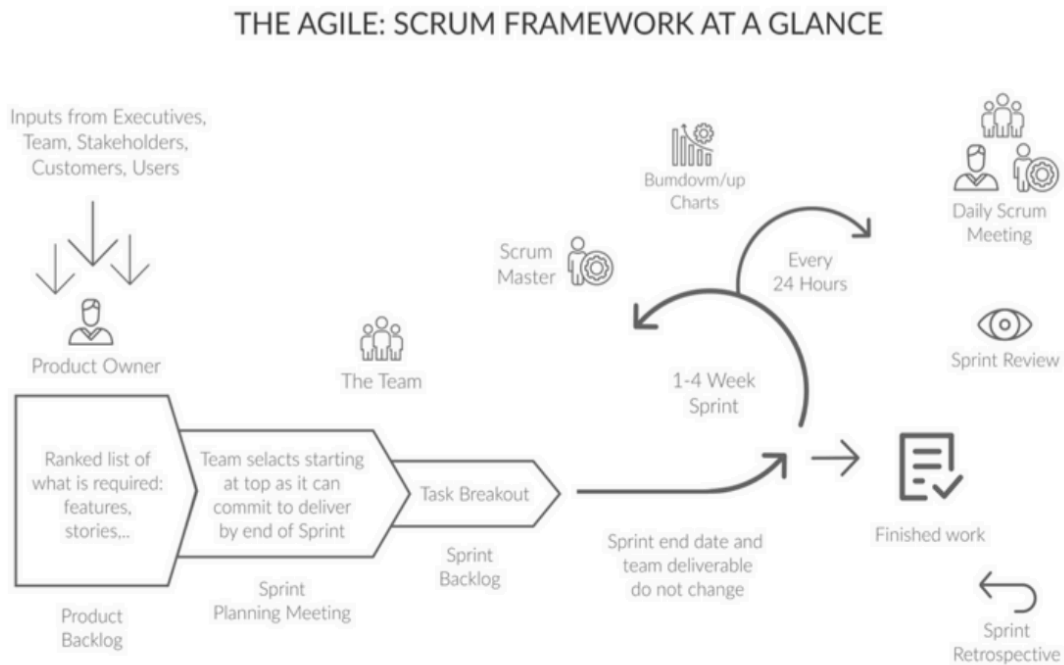
Create a release plan grouping user stories into releases. Estimate the effort using Estimation Poker or T-Shirt Sizing.

Exercise 2: Sprint Planning

- Define sprint goals, select user stories, and create a plan for execution.

Appendix

- Agile Framework Diagram:

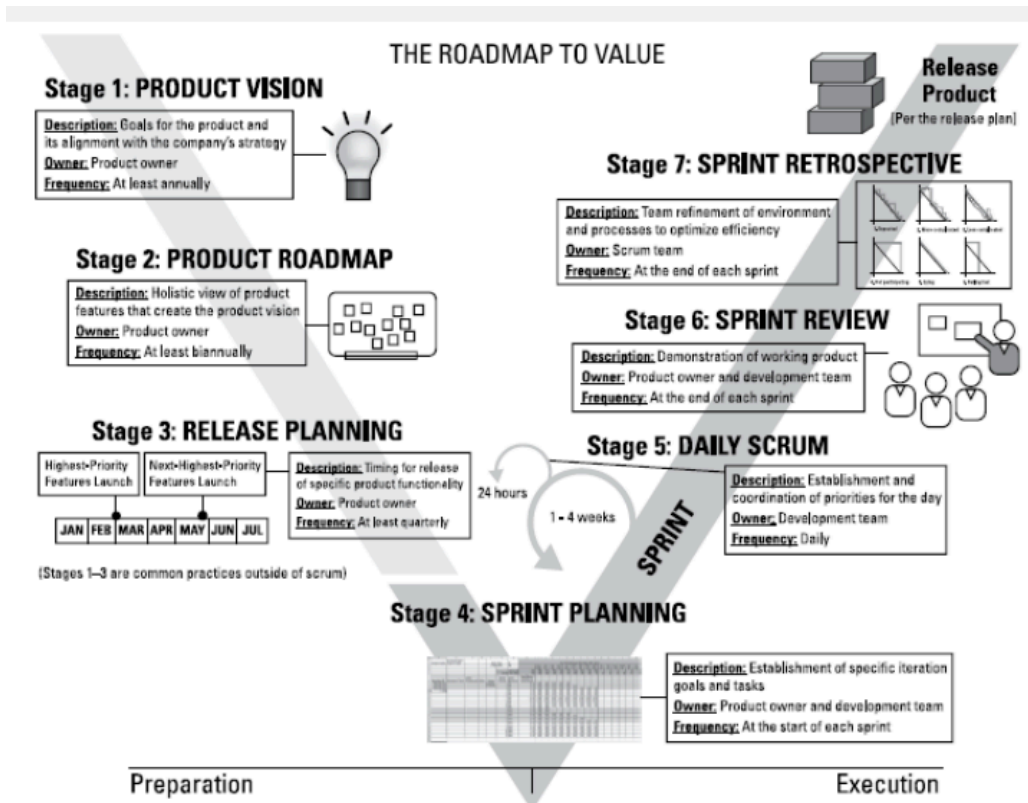


- Release Planning Table:

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User stories					



- Roadmap to Value



- Product Vision

Vision Statement for Product

For _____ (target customer)
 who _____ (needs)
 the _____ (product name)
 is a _____ (product category)
 that _____ (product benefit, reason to buy)
 Unlike _____ (competitors)
 our product _____ (differentiation/value proposition)

- Virtual progress Tracking

RELEASE GOAL:

SPRINT GOAL:

RELEASE DATE:

SPRINT REVIEW:

US = User Story

Task = Task

TO DO	IN PROGRESS	ACCEPT	DONE
			US Task Task Task Task Task Task Task Task Task Task Task Task
		US	Task Task Task Task Task Task Task Task Task Task Task Task
Task Task Task Task Task Task Task Task	US Task Task Task Task Task		
US Task Task Task Task Task Task Task Task			