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# Azure DevOps

Hans-Petter Halvorsen

# Azure DevOps

- In the simplest terms, Azure DevOps is the evolution of VSTS (Visual Studio Team Services).
- It is the result of years of using their own tools and developing a process for building and delivering products in an efficient and effective way.
- Web Site: <https://dev.azure.com>

<https://www.halvorsen.blog>



# What is “DevOps”?

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# What is “DevOps”?

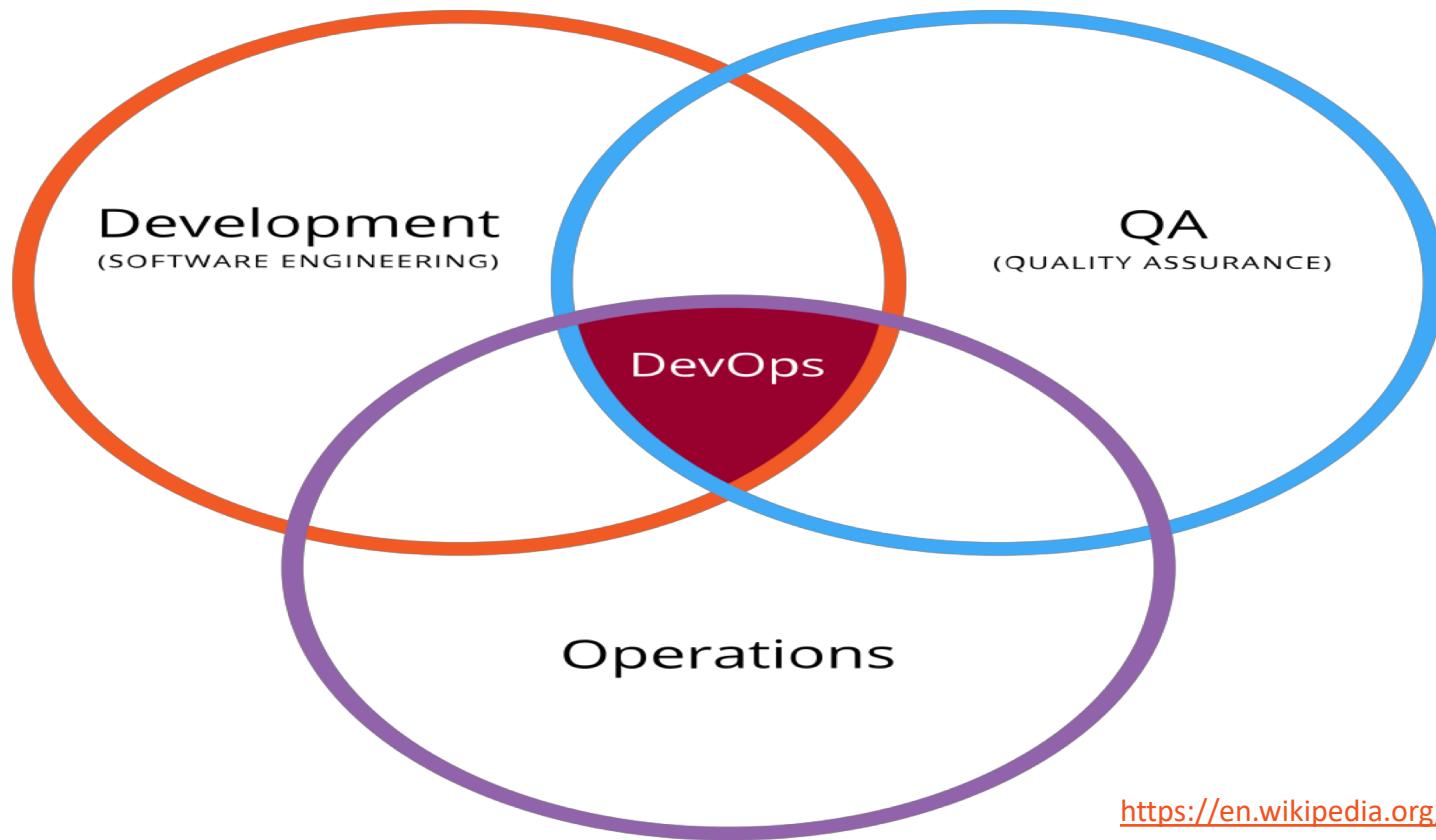
- DevOps is a Software Development Methodology that combines Software Development (Dev) with Operations /Production (Ops)
- The goal of DevOps is to shorten the systems development life cycle while delivering features, fixes, and updates frequently in close alignment with daily Operations

# What is “DevOps”?

A defining of DevOps is:

- “DevOps is a set of practices intended to reduce the time between committing a change to a system and the change being placed into normal production, while ensuring high quality”

# What is “DevOps”?



# What is “DevOps”?

DevOps typically includes the following Key Topics and Tools:

- **Coding** – code development and review, source code management tools, code merging
- **Building** – continuous integration tools, build status
- **Testing** – continuous testing tools that provide feedback on business risks
- **Packaging** – artifact repository, application pre-deployment staging
- **Releasing** – change management, release approvals, release automation
- **Configuring** – infrastructure configuration and management, infrastructure as code tools
- **Monitoring** – applications performance monitoring, end-user experience

# “DevOps” and Agile Software Development

- The need for DevOps arose from the increasing success of Agile Software Development
- Organizations wanted to release their Software faster and more frequently

# Goals with “DevOps”

- Improved deployment frequency
- Faster time to market
- Lower failure rate of new releases
- Shortened lead time between fixes
- Faster mean time to recovery (in the event of a new release crashing or otherwise disabling the current system)

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# Start using Azure DevOps

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# Start using Azure DevOps

- Go to the Azure DevOps Web Site and register for the Service.
- Web Site: <https://dev.azure.com>

<https://www.halvorsen.blog>



# Create New Project

Hans-Petter Halvorsen

# New Project



My organizations

A alarmsystem

B bachelor-v17-imsephi

C CheckpointAS

E ees17

O olavd

R Rutor

S software-usn

S systemutviklingogdokumentasj...

## software-usn

Projects My work items My pull requests

E

EnvironmentalPublicHealth

All projects

E

EnvironmentalPublicHealth

SE

Software Engineering

T

TestProject

This is a test project used to test the functionality in VSTS

Related pages

What's new in DevOps

Documentation

Get help

+ New organization

Organization settings

### Create new project

Project name \*

MySoftware

Description

Visibility



Public ⓘ

Anyone on the internet  
can view the project.  
Certain features like  
TFVC are not supported.



Private

Only people you give  
access to will be able to  
view this project.

Public projects are disabled for your organization. You can turn on public visibility  
with [organization policies](#).

Advanced

Version control ⓘ

Team Foundation Version Control

Work item process ⓘ

Scrum

Make sure to select  
these settings

Create

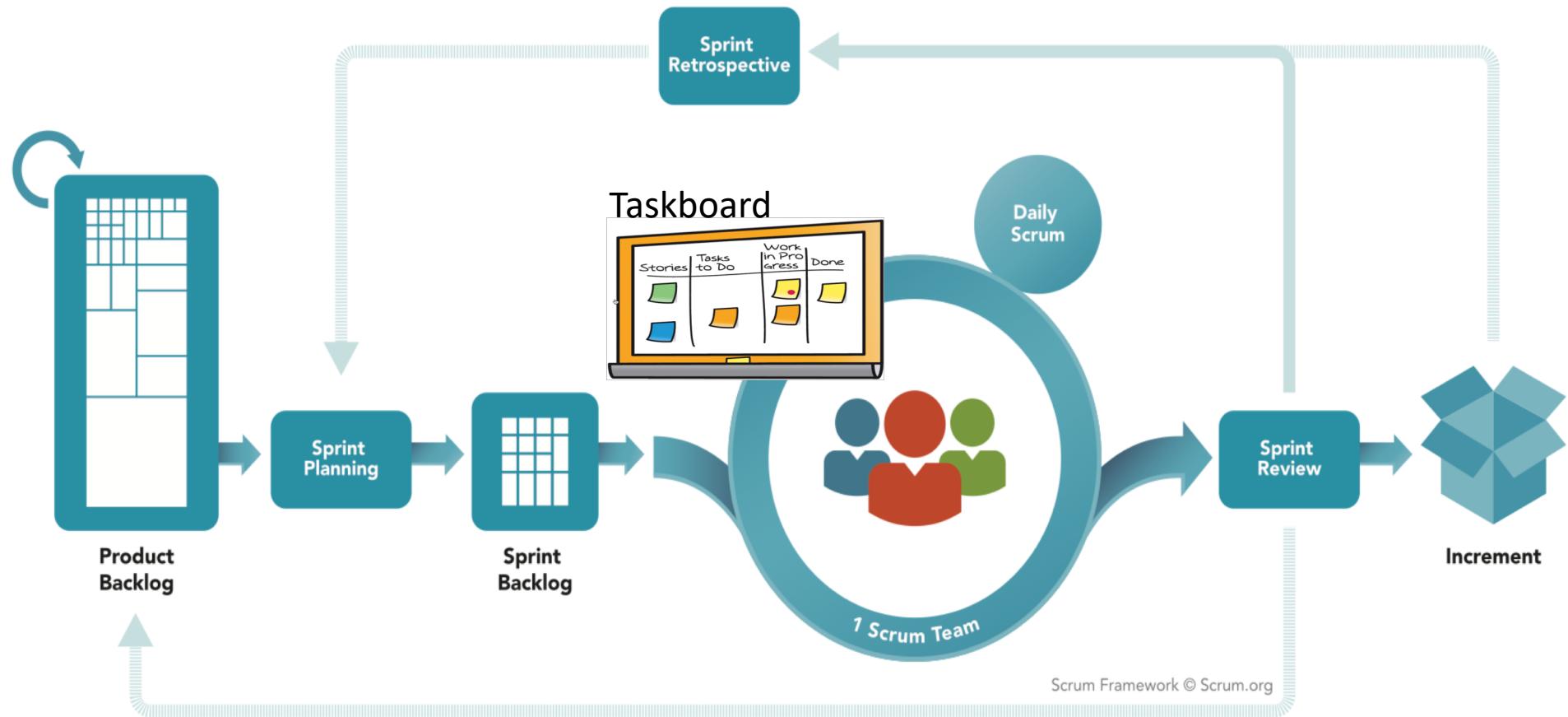
Cancel

# Scrum

- Scrum is a Framework for creating Software
- <https://www.scrum.org>

Introduction to Scrum: [https://youtu.be/gy1c4\\_YixCo](https://youtu.be/gy1c4_YixCo)

# Scrum



# My Project



software-usn / MySoftware / Overview / Summary

Search



M MySoftware



Full access to Azure Pipelines for Stakeholders: Give Stakeholders full access to Azure Pipelines for private projects. [Learn more](#)

Try it!

Not now

Overview

Summary

Dashboards

Wiki

Boards

Repos

Pipelines

Test Plans

Artifacts

## MySoftware

Private

Invite



### About this project

Like 0



Development of MySoftware

### Project stats

Last 7 days

#### Repos



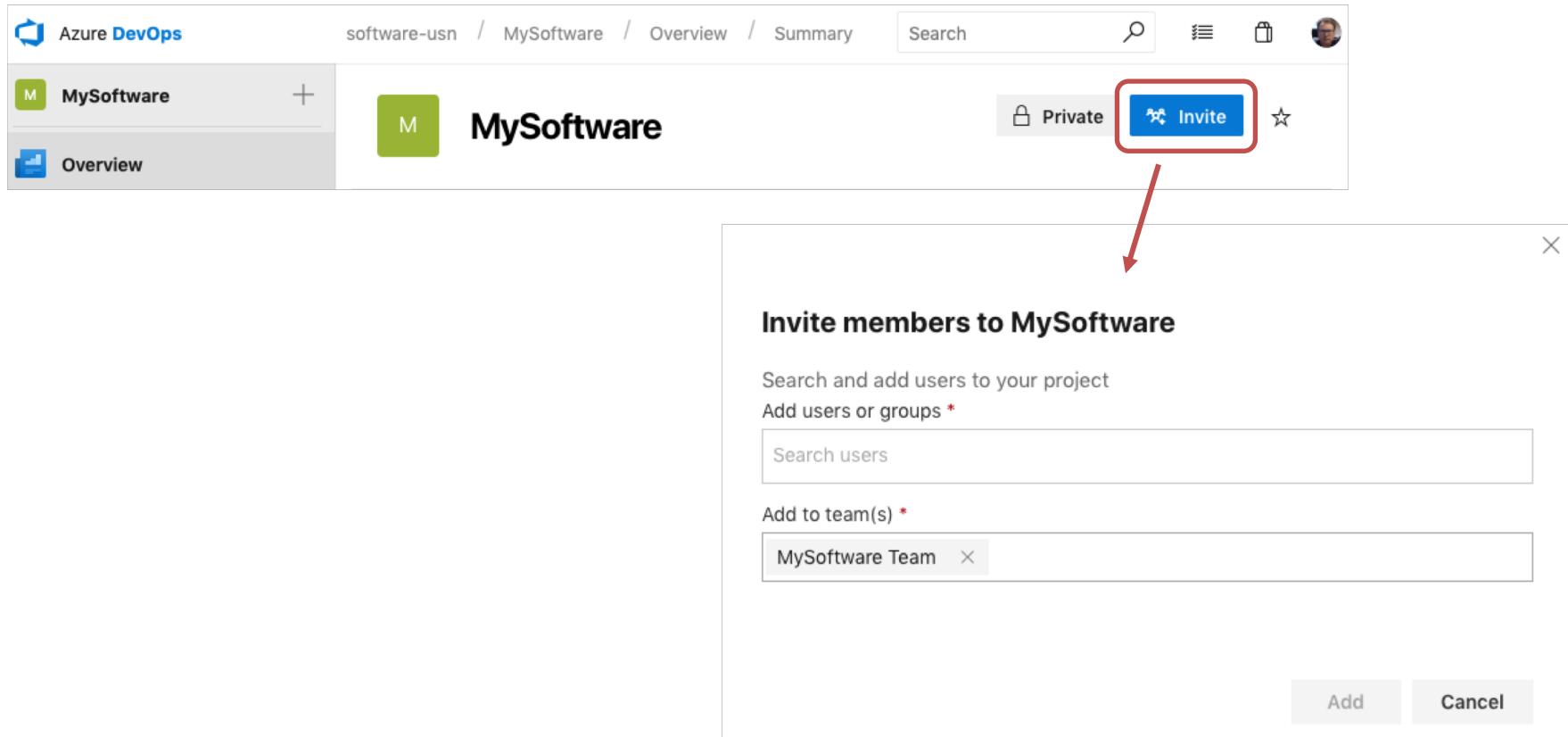
1

Changesets by 1 authors

### Members 1



# Invite Members



Azure DevOps software-usn / MySoftware / Overview / Summary

Search ≡ ⌂ 🗑️

MySoftware + M MySoftware Private Invite ★

Overview

**Invite members to MySoftware**

Search and add users to your project

Add users or groups \*

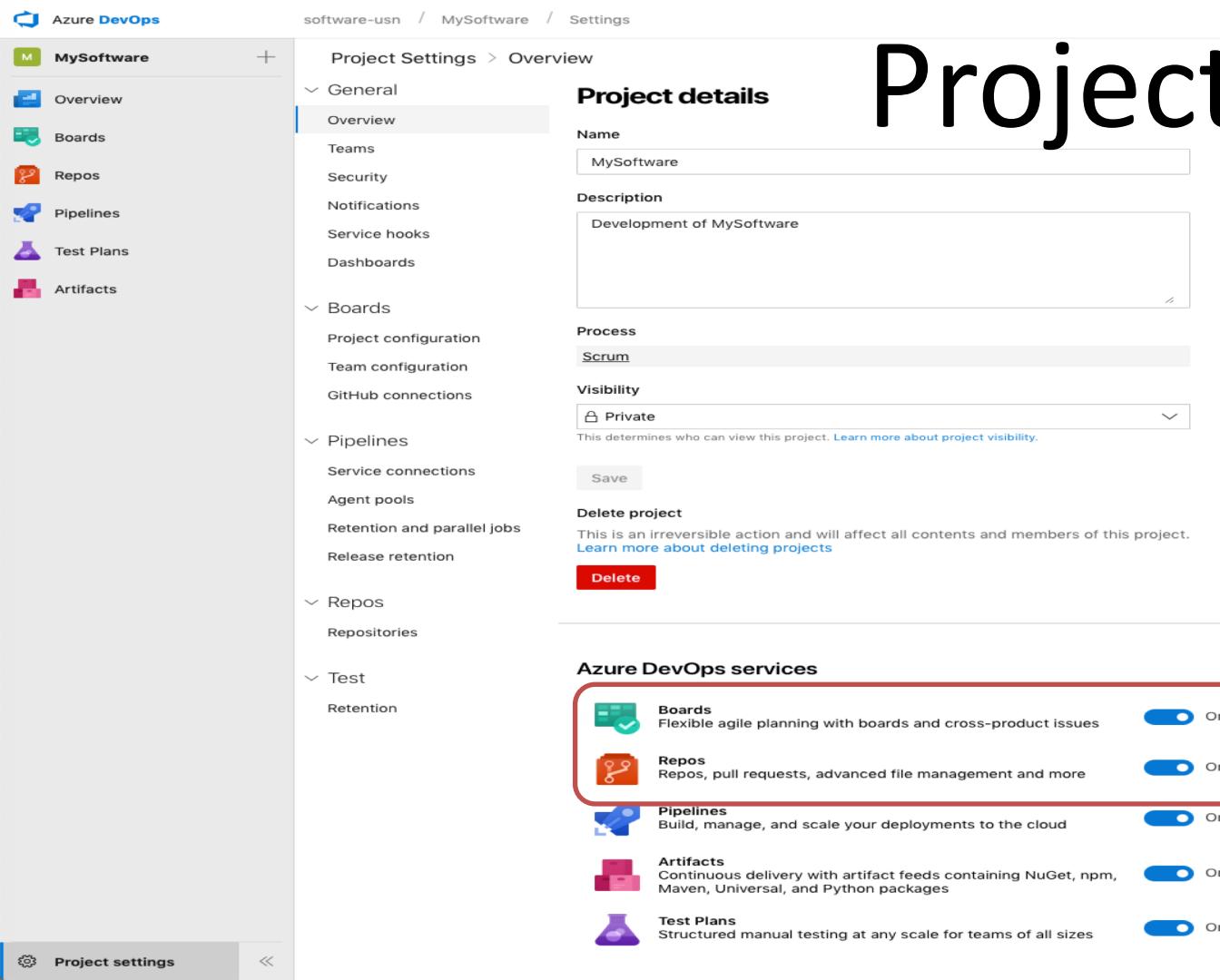
Search users

Add to team(s) \*

MySoftware Team ×

Add Cancel

# Project Settings



The screenshot shows the Azure DevOps Project Settings Overview page for a project named "MySoftware". The left sidebar lists various settings categories: Overview, Boards, Repos, Pipelines, Test Plans, Artifacts, Boards, Pipelines, Repos, Test, and Retention. The "Overview" section under Boards is currently selected. The main content area displays "Project details" with fields for Name (MySoftware), Description (Development of MySoftware), Process (Scrum), and Visibility (Private). A "Save" button is present. Below this, a "Delete project" section contains a warning message and a red "Delete" button. The "Azure DevOps services" section at the bottom lists five services: Boards, Repos, Pipelines, Artifacts, and Test Plans, each with an "On" toggle switch. A red box highlights the first two services, and a red bracket on the right side groups them, with the text "These you can turn off (will not be used in this Project)" pointing to them.

Azure DevOps

software-usn / MySoftware / Settings

Search

Project settings

MySoftware

Overview

Boards

Repos

Pipelines

Test Plans

Artifacts

Project Settings > Overview

General

Overview

Teams

Security

Notifications

Service hooks

Dashboards

Boards

Project configuration

Team configuration

GitHub connections

Pipelines

Service connections

Agent pools

Retention and parallel jobs

Release retention

Repos

Repositories

Test

Retention

Project details

Name

MySoftware

Description

Development of MySoftware

Process

Scrum

Visibility

Private

This determines who can view this project. [Learn more about project visibility.](#)

Save

Delete project

This is an irreversible action and will affect all contents and members of this project. [Learn more about deleting projects](#)

Delete

Azure DevOps services

Boards

Flexible agile planning with boards and cross-product issues

On

Repos

Repos, pull requests, advanced file management and more

On

Pipelines

Build, manage, and scale your deployments to the cloud

On

Artifacts

Continuous delivery with artifact feeds containing NuGet, npm, Maven, Universal, and Python packages

On

Test Plans

Structured manual testing at any scale for teams of all sizes

On

These you can turn off (will not be used in this Project)

# Configure Iterations/Sprints

Azure DevOps software-usn / MySoftware / Settings Search

MySoftware + Project Settings > Project configuration

General Boards This project is currently using the Scrum process. To customize your work item types, go to the process customization page.

Overview Iterations Areas

Teams Create and manage the iterations for this project. These iterations will be used by teams for iteration planning (sprint planning). [Learn more about customizing areas and iterations](#)

Security

Notifications To select iterations for the team, go to the default team's settings.

Service hooks New New child | + ≡

Dashboards Iterations Start Date End Date

Boards MySoftware

	Iterations	Start Date	End Date
Sprint 1			
Sprint 2			
Sprint 3			
Sprint 4			
Sprint 5			
Sprint 6			

Project configuration

Team configuration

GitHub connections

Repos

# Configure Areas

Azure DevOps software-usn / MySoftware / Settings

Search    

**MySoftware** + Project Settings > Project configuration

General Boards  This project is currently using the Scrum process. To customize your work item types, go to the process customization page.

Overview Overview Iterations **Areas**

Teams Create and manage the areas for this project. These areas will be used by teams to determine what shows up on the team's backlog and what work items the team is responsible for. [Learn more about customizing areas and iterations](#).

Security To select areas for the team, go to [the default team's settings](#).

Notifications

Service hooks New New child  

Dashboards Areas Teams

Areas  MySoftware MySoftware Team

Teams 

Boards 

Project configuration  Database 

Team configuration Database Scripts 

GitHub connections Stored Procedures 

Desktop Tables 

DesktopApp1 

Pipelines 

Documentation 

Service connections Installation Guide 

Agent pools User Manual 

Retention and parallel jobs Web 

Release retention WebApp1 

Repos 

Project settings 

# Configure Backlog

Azure DevOps software-usn / MySoftware / Settings Search

**MySoftware** + Project Settings > Team configuration > MySoftware Team ▾

General Boards i This project is currently using the Scrum process. To customize your work item types, go to the process customization page.

Overview General Iterations Areas Templates

Teams Backlogs

Security See only the backlogs your team manages.

Notifications Backlog navigation levels

Service hooks  Epics

Dashboards  Features

Backlog items

Boards Working days

Project configuration Capacity and burndown are based on the days your team works.

Team configuration Select days

GitHub connections  Monday

Repos  Tuesday

Monday Wednesday Thursday Friday Saturday Sunday

Wednesday

Thursday

Friday

Saturday

Sunday

Repositories

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# Work Items

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# Work Items

Azure DevOps software-usn / MySoftware / Boards / Work Items

Search

MySoftware

Overview

Boards

Work Items

Boards

Backlogs

Sprints

Queries

Repos

Work Items

Recently updated

+ New Work Item

Open in Queries

Column Options

Recycle Bin

Filter by keyword

Bug

Epic

Feature

Impediment

Product Backlog Item

Task

Test Case

ID Title

99 The

Assigned To

State

Area Path

in a Database ... Unassigned New MySoftware

Type	Assigned to	State	Area Path
Product Backlog Item	Unassigned	New	MySoftware

# Work Items

Most used Work Item Types:

- **Product Backlog Item (PBI)**
  - List of all things that needs to be done within the project, i.e., list of requirements
- **Task**
  - Each PBI needs to be broken down into a set of Tasks
  - A Task is something that should be done by the developer
- **Bug**
  - Used to report Bugs in your Software
- **Feature**
  - Typically a stakeholder that wants a new feature in the Software that is not included in the original Requirements

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# Product Backlog

Hans-Petter Halvorsen

# Product Backlog

- In the simplest definition the **Scrum Product Backlog** is simply a list of all things that needs to be done within the project.
- It replaces the traditional requirements specification artifacts.
- These items can have a technical nature or can be user-centric e.g. in the form of user stories.

# Product Backlog

- The Product Backlog is an ordered list of everything that is known to be needed in the product.
- It is the single source of requirements for any changes to be made to the product.

Sprint 1

Sprint 2+3

Sprint 4....

Requirement

# Product Backlog

- A Product Backlog is never complete.
- The earliest development of it lays out the initially known and best-understood requirements.
- The Product Backlog evolves as the product and the environment in which it will be used evolves.
- The Product Backlog is dynamic; it constantly changes to identify what the product needs to be appropriate, competitive, and useful.
- If a product exists, its Product Backlog also exists.

# Product Backlog

Azure DevOps software-usn / MySoftware / Boards / Backlogs

Search

**MySoftware** +

MySoftware Team New Work Item View as board Column options ... Backlog items

Get started with your product backlog

Use the "New Work Item" command to create and prioritize work items [Learn more about backlogs](#)

Project settings

# Create Product Backlog Items

Azure DevOps    software-usn / MySoftware / Boards / Backlogs

**M** MySoftware +

MySoftware Team ▾ ⭐ ⚙

+ New Work Item    Product Ba... ▾    Add to top | ▾

Order	Work Item Type	Title	State	Effort	Value Area
1	Product Back...	The system should store the data in a Dataabse	New		Business

Backlogs

Sprints

This screenshot shows the Azure DevOps interface for managing a product backlog. The left sidebar has a 'Backlogs' item highlighted with a red box. The main area shows a backlog board for the 'MySoftware' project. A 'New Work Item' button is highlighted with a red box. A single backlog item is listed: '1 Product Back... The system should store the data in a Dataabse' with a status of 'New'. The top navigation bar shows the path: software-usn / MySoftware / Boards / Backlogs.

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# Tasks

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# Tasks

- Each PBI needs to be broken down into a set of Tasks
- A Task is something that should be done by the developer

# Tasks

NEW TASK \*

## Create SQL Server

Unassigned 0 comments Add tag

Save & Close ...

State	To Do	Area	MySoftware
Reason	New task	Iteration	MySoftware\Sprint 1

Details (1) U

Description	Details	Development
Click to add Description	Priority 2 Remaining Work	+ Add link Development hasn't started on this item.

Discussion

Add a comment. Use # to link a work item, ! to link a pull request, or @ to mention a person.

Activity

Blocked

Related Work

+ Add link ▾

Parent

99 The system should store ...  
Updated 30 minutes ago, ● New

# Product Backlog Items and Tasks

Azure DevOps software-usn / MySoftware / Boards / Backlogs Search

**MySoftware** + MySoftware Team ... Backlog items

	Order	Work Item Type	Title	State	Effort
1		Product Backlog Item	■ The system should store the data in a Dataabse	New	
		Task	■ Create SQL Server	To Do	
2		Product Backlog Item	■ A Web Application should be created	New	
		Task	■ Create Tables	To Do	
3		Product Backlog Item	■ Install Visual Studio	New	
		Task	■ Learn ASP.NET	To Do	
		Product Backlog Item	■ The System should be properly documented	New	
		Task	■ Create User Manual	To Do	

Backlogs Boards Work Items Sprints Queries Repos Project settings

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# Task Board

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# Azure Boards

- Plan, Track, and Discuss your work within your Team
- Scrum/Kanban Board (Task Board)

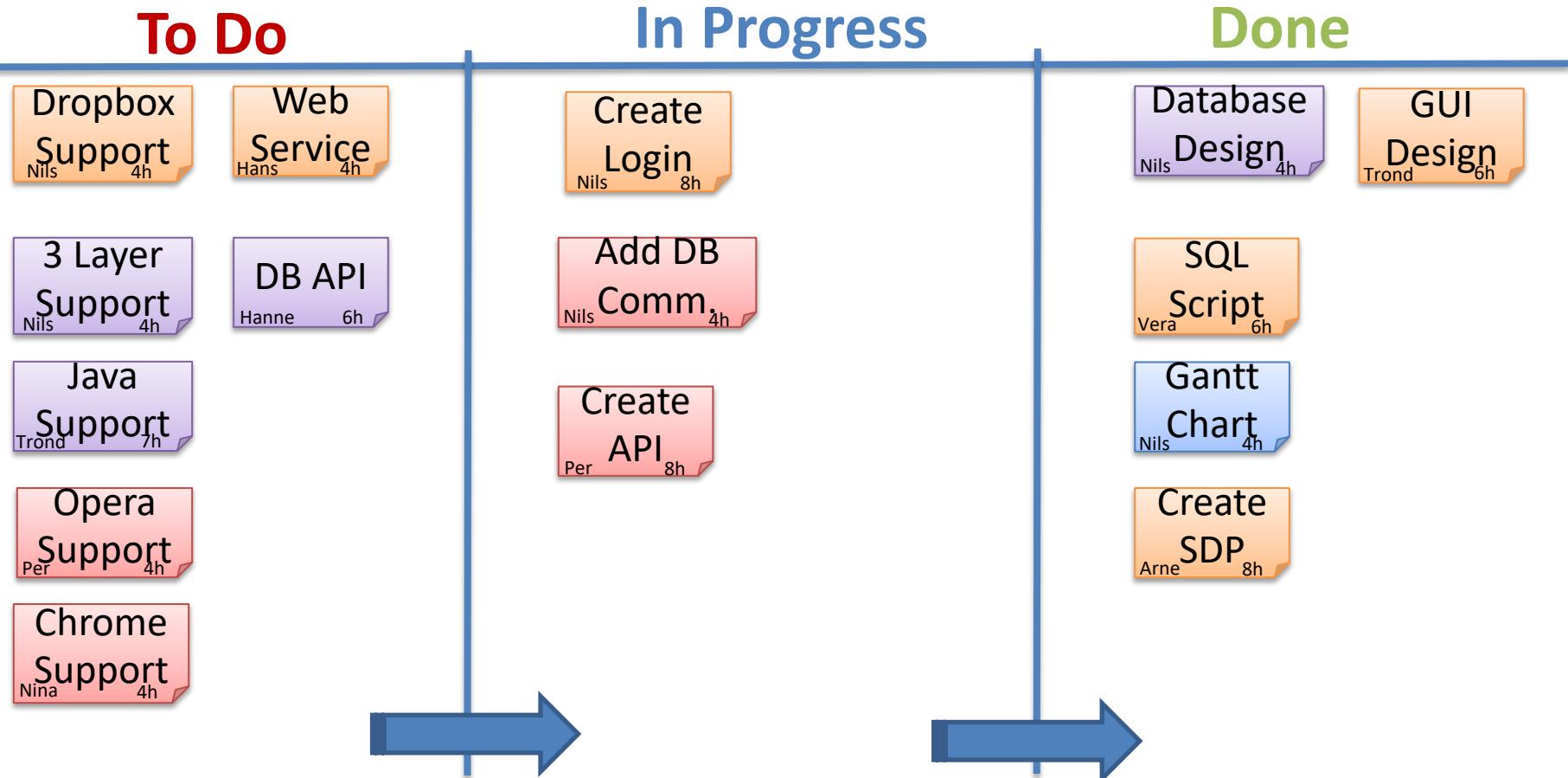
# Sprints/Iteration

- In Scrum we divide the work into different Iterations
- An Iteration is called a Sprint
- When a new Sprint starts we need to select/create a set of Tasks for that iteration into the Taskboard

# Scrum Board (Taskboard)

- A physical board to visualize information for and by the Scrum Team, often used to manage Sprint Backlog.
- Scrum boards are an optional implementation within Scrum to make information visible.

# Scrum Board (Taskboard)



# Taskboard

## ⌚ To Do

**Avklare om vi trenger formelle prosjektmøter** ×  
Nils-Olav Skeie  
Low Priority - Hours: 4h

**Booke møterom ifm ukentlige statusmøter** ×  
Nils-Olav Skeie  
Low Priority - Hours: 1h

**Lag utkast til Kravspesifikasjon** ×  
Anders Theodorsen  
High Priority - Hours: 2h

**Lag utkast til overordnet Systemskisse av ny løsning som skal lages** ×  
Anders Theodorsen  
High Priority - Hours: 4h

Total Hours: 11

## ⌚ In Progress

**Beskriv eksisterende system** ×  
Anders Theodorsen  
High Priority - Hours: 4h

**Lag første utkast til rapport** ×  
Anders Theodorsen  
Medium Priority - Hours: 4h

**Lag utkast til Riskanalyse** ×  
Anders Theodorsen  
Medium Priority - Hours: 2h

**Lage initiatte Taskgrupper og Tasker slik at vi kommer i gang med første iterasjon** ×  
Anders Theodorsen  
Low Priority - Hours: 4h

Total Hours: 14

## ✓ Done

**Sjekk tilgang til Canvasrom for FMH 606 og les gjennom notatet om generell informasjon.** ×  
Anders Theodorsen  
Low Priority - Hours: 4h

**Startup Meeting** ×  
Nils-Olav Skeie  
Medium Priority - Hours: 1h

Total Hours: 5

This is an Example made with another Tool

# Boards

Azure DevOps software-usn / MySoftware / Boards / Work Items

Search    

**MySoftware** +

**Work Items**

Recently updated   New Work Item  Open in Queries  Column Options  Recycle Bin

 Filter by keyword  Types  Assigned to  States  Area  Tags 



**Find recently updated items**

View items that have been recently updated.

[Learn more about work items](#)

 Boards

 Work Items

 Boards

 Backlogs

 Sprints

 Queries

 Repos

 Pipelines

 Test Plans

 Artifacts

 Project settings 

# Taskboard

Azure DevOps software-usn / MySoftware / Boards / Sprints

MySoftware Team ▾ ⚡ ⚠ No iteration dates Set dates

Taskboard Backlog Capacity + New Work Item ▾ Sprint 1 ▾ ⚡ ⚠ ⚡ ⚡ ⚡ ⚡

Collapse all

To Do	In Progress	Done
<p>99 The system should store the data in a Database Unassigned State: New</p> <p>+ </p>	<p>101 Create Tables Unassigned State: In Progress</p> <p>102 A Web Application should be created Unassigned State: To Do</p> <p>+ </p>	<p>100 Create SQL Server Unassigned State: Done</p> <p>103 Install Visual Studio Unassigned State: To Do</p> <p>+ </p>
<p>105 The System should be properly documented Unassigned State: New</p> <p>+ </p>		

Project settings

The screenshot shows the Azure DevOps Taskboard for the 'MySoftware' project. The left sidebar includes links for Overview, Boards, Backlogs, Sprints, Queries, and Repos. The main area displays a taskboard for the 'MySoftware Team' with three columns: To Do, In Progress, and Done. The 'To Do' column contains one work item (id 99) titled 'The system should store the data in a Database'. The 'In Progress' column contains two work items (ids 101 and 102): 'Create Tables' and 'A Web Application should be created'. The 'Done' column contains one work item (id 100) titled 'Create SQL Server'. Each work item card shows its ID, title, assignee (Unassigned), state, and a 'New' or 'In Progress' status indicator. There are green '+' buttons in each column to add new work items.

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# File Structure

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# Folders and Files

Azure DevOps interface showing the 'Files' section for the repository '\$/MySoftware'. The left sidebar shows navigation options: Overview, Boards, Repos, Files (selected), Changesets, and Shelvesets. The top navigation bar shows the path: software-usn / MySoftware / Repos / Files / \$/MySoftware. The main area displays the contents of the '\$/MySoftware' folder, which contains a single folder named 'BuildProcessTemplates'. A context menu is open over this folder, listing 'File' and 'Folder' options. The menu also includes 'New', 'Upload file(s)', and 'Download as Zip' buttons. The bottom right corner shows statistics: 78 Changesets and 1 Che.

software-usn / MySoftware / Repos / Files / \$/MySoftware

MySoftware

Overview

Boards

Repos

Files

Changesets

Shelvesets

\$/MySoftware /

\$/MySoftware

BuildProcessTemplates

Contents History

New Upload file(s) Download as Zip

Name ↑

File

Folder

78 Changesets

1 Che

# Folders and Files

The screenshot shows the Azure DevOps interface for managing files in a repository. The left sidebar has a 'MySoftware' project selected. The 'Files' tab is active. The top navigation bar shows the path: software-usn / MySoftware / Repos / Files / \$/MySoftware. A search bar and various navigation icons are at the top right.

The main area displays the contents of the '\$/MySoftware' folder. It includes sub-folders like 'BuildProcessTemplates', 'Code' (which contains 'Database', 'Desktop' (with 'DesktopApp1'), 'Examples', 'Web' (with 'WebApp1'), and 'Documents'), and other documentation folders ('Process Documentation' and 'Product Documentation'). A message indicates a checked-in changeset with 95 items added. The table lists the folder structure with columns for Name, Last change, and Changesets.

Name ↑	Last change	Changesets
BuildProcessTemplates	3 hours ago	78 Checking in new...
Code	3 minutes ago	80 Added folder Co...
Documents	4 minutes ago	79 Added folder Do...

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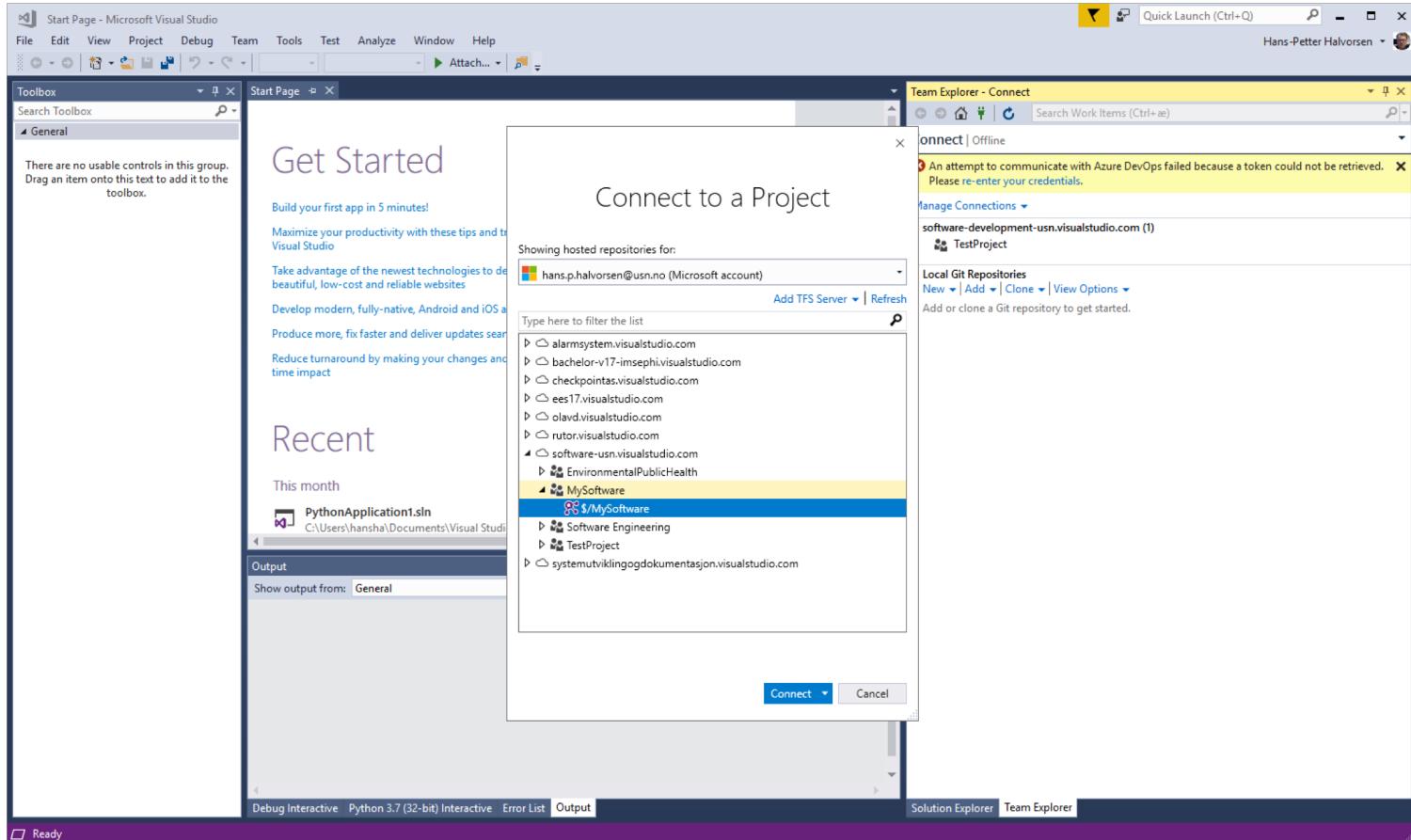
# Visual Studio

Hans-Petter Halvorsen

# Visual Studio

- You use Visual Studio to connect to the Repository/Project
- Possible to Check-in/Check-out your Code
- ...

# Connect to Project



# Source Control Explorer

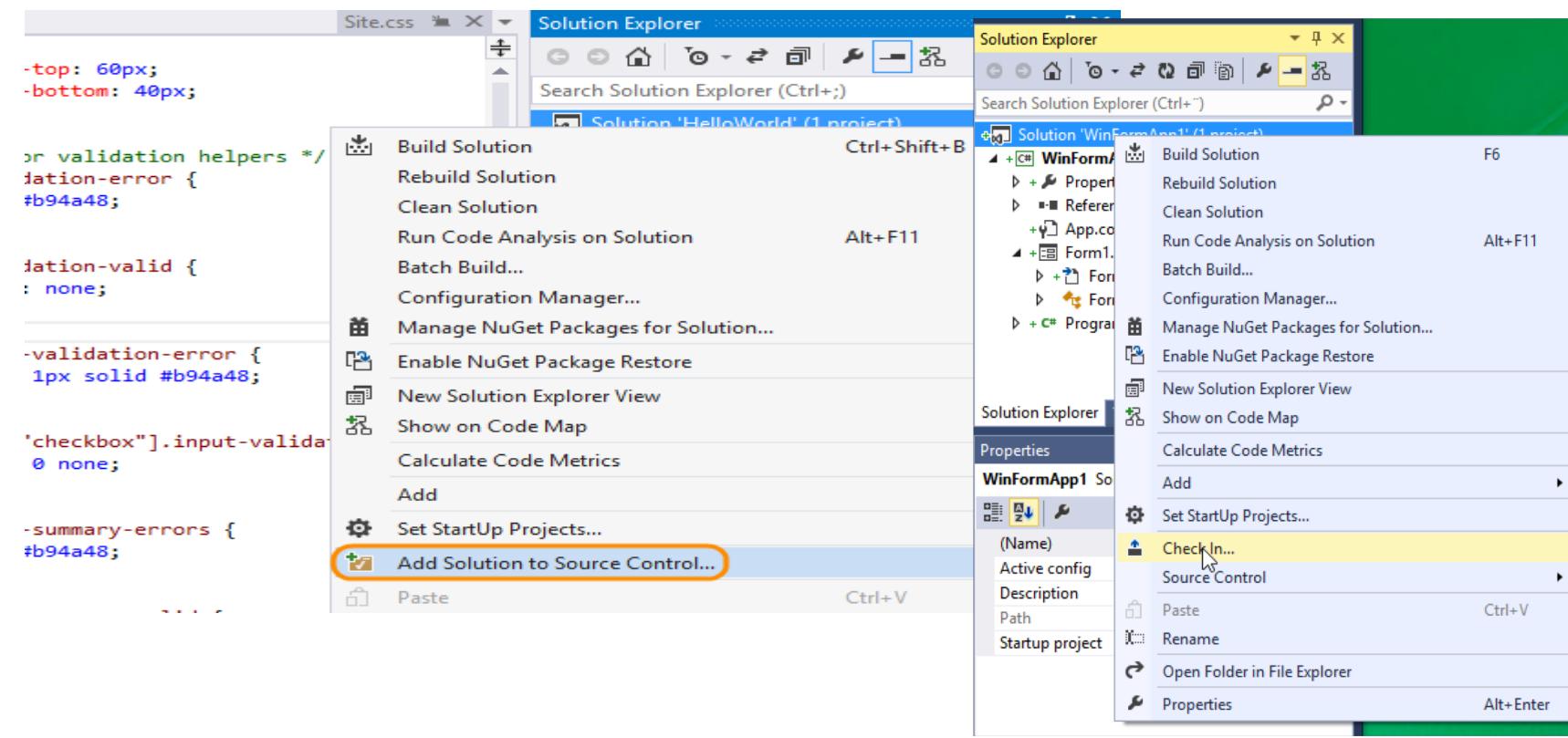
The screenshot shows the Visual Studio IDE interface with the Source Control Explorer and Team Explorer windows open.

**Source Control Explorer:** This window displays the local path `C:\Work\VSTS-USN\MySoftware`. It lists a folder named `BuildProcessTemplates` under the `MySoftware` project. A context menu is open over this folder, with the `Get Latest Version` option highlighted.

Name	Pending Change	User	Latest	Last Check-in
BuildProcessTemplates			Not ...	2019-01-09 09:...
			Not ...	2019-01-09 13:...
			Not ...	2019-01-09 13:...

**Team Explorer - Home:** This window provides an overview of the development environment. It shows the Azure DevOps project `MySoftware` (`https://software-usn.visualstudio.com/MySoftware`). It includes sections for `Project` (Web Portal | Task Board), `Solutions` (Workspace: XPS15HPH), and various links for My Work, Pending Changes, Work Items, Builds, and Settings.

# Check-in/Check-out



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# Bug Reporting and Monitoring

Hans-Petter Halvorsen

# Bug Reporting and Monitoring

We can use Azure DevOps for Reporting and Monitoring Bugs, Feature Requests, etc.

- Work Items
- Queries

# New Bug

Azure DevOps software-usn / MySoftware / Boards / Work Items

**MySoftware** +

Work Items

Recently updated ▾ [New Work Item](#) ▾ [Bug](#)

[Open in Queries](#) [Column Options](#) [Recycle Bin](#)

Filter by keyword

ID	Title
104	Lea
101	Cre
106	Cre
102	A Web Application should be
105	The System should be proper
103	Install Visual Studio
99	The system should store the

**Bug**

NEW BUG \*

Communication with Database System Not Working

Unassigned 0 comments Add tag Save

State: New Reason: New defect reported Area: MySoftware Iteration: MySoftware

Repro Steps: Click to add Repro Steps

System Info: Click to add System Info

Acceptance Criteria: Click to add Acceptance Criteria

Details: Priority: 2 Severity: 3 - Medium Effort: Remaining Work: Activity:

Development: Add link

Related Work: Add link There are no links in this group.

Build: Found in Build Integrated in Build

Add a comment. Use # to link a work item, ! to link a pull request, or @ to mention a person.

# Feature Request

Azure DevOps software-usn / MySoftware / Boards / Work Items

**MySoftware** +

Work Items

Recently updated ▾ [New Work Item](#) [Open in Queries](#) [Column Options](#) [Recycle Bin](#)

Filter by keyword

ID	Title	Assigned To	State	Area Path
104	Lea	Unassigned	In Progress	MySoftware
101	Cre	Unassigned	In Progress	MySoftware
106	Cre	Unassigned	To Do	MySoftware
102	A Web Application should be created	Unassigned	New	MySoftware
105	The System should be properly documented	Unassigned	New	MySoftware
103	Install Visual Studio	Unassigned	To Do	MySoftware
99	The system should store the data in a Dataabse	Unassigned	New	MySoftware

**New Work Item** ▾

- Bug
- Epic
- Feature**
- Impediment
- Product Backlog Item
- Task
- Test Case

# Queries

Azure DevOps

software-usn / MySoftware / Boards / Queries

Search



M MySoftware



Overview

Boards

Work Items

Boards

Backlogs

Sprints

Queries

Repos

Pipelines

Test Plans

Artifacts

Project settings



Queries > My Queries > Untitled query

Run to see the query results.

Results

Editor

Charts

Run query

New

Save query

Revert changes

Column options

...



Type of query Flat list of work items

Query across projects

Filters for top level work items

And/Or

Field

Operator

Value

+  Work Item Type = [Any]

+  And State = [Any]

+ Add new clause

ID Work Ite... Title

Assigned To

State

Tags



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