# ACS 567 Software Project Management

# Homework 07

# (Ashwini Kulkarni)

1. **Technical Debt**
2. **Please list three types of technical debts.**

Naïve technical debt

Unavoidable technical debt

Strategic technical debt

1. **Please briefly describe the consequence of technical debts.**

**Unpredictable tipping point**

An important attribute of technical debt is that is grows in an unpredictable, nonlinear fashion When the product reaches a tipping point, it becomes unmanageable or chaotic. At the tipping point, even small changes to the product become major occasions of uncertainty

**Increased time to delivery**

The greater the debt today, the slower the velocity tomorrow will lead to increased time to delivery.

**Significant number of debts**

Products with significant technical debt become more complex, making it harder to do things correctly. The compounding defects become a major disruption to the normal flow of value-added development work.

**Rising development and support costs**

In the presence of increasing levels of technical debt, even small changes become very expensive. Rising costs can change the economics of whether to proceed with a feature or debt repair

**Product atrophy**

As we stop adding new features or fixing defects that could rejuvenate our aging product, the product becomes less and less appealing to current and potential customers

As a result, the product starts to atrophy and simply ceases to be a viable option for most customers

**Decreased predictability**

For a product with high levels of technical debt, making any sort of predication is nearly impossible. There is simply too much uncertainty surrounding how long something might take when dealing with a debt-ridden product.

**Underperformance**

As technical debt increases, people come to expect increasingly lower development performance and therefore reduce their expectations of what is possible. The lowered expectations start to propagate through the value chain, resulting in lower overall performance on an organization-wide basis.

**Universal frustration**

Everyone in the value chain becomes frustrated. The accumulation of all of those small but annoying shortcuts makes work on the product painful.

**Decreased customer satisfaction**

Customer satisfaction will decrease as customer frustration increases. The consequences of technical debt can substantially affect our customers and their perception of us.

1. Please list the activities for managing technical debts.

Use good technical practices

Using good technical practices is an excellent starting point. Applying practices such as simple design, test-driven development, continuous integration, automated testing, refactoring will help teams stop adding many forms of naive debt to their products.

Use a strong definition of done

Work that we should have performed when a feature was built, but ended up deferring until a later time, is an important cause of technical debt.

Using Scrum, we want a strong definition of done to help guide the term to a low- or no-debt solution at the end of each sprint

Properly understand technical debt economics

To use technical debt strategically and advantageously, first need to understand how it affects the economics of our decisions.

1. **MySQL**

SQL query(Combined Q1 and Q2)

CREATE TEMPORARY TABLE IF NOT EXISTS PROF\_AVG AS (

SELECT SUM( A.average\_each ) / COUNT( \* ) as pf\_avg

FROM (

SELECT SUM( Evaluation ) / COUNT( \* ) AS average\_each

FROM CourseEvaluation

GROUP BY ProfessorID

)A

);

SELECT pf\_avg as Q1\_ANS FROM PROF\_AVG;

SELECT A.ProfessorID, A.average\_each AS Professor\_Eval

FROM

(SELECT SUM( Evaluation ) / COUNT( \* ) as average\_each , ProfessorID

FROM CourseEvaluation

GROUP BY ProfessorID) A, PROF\_AVG B where A.average\_each > B.pf\_avg;

Output

