Preliminary Title

Preliminary Description

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Abstract

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Contents

1 Introduction

There are many paradigms of commercial sensor management and monitoring. Organizations can use anything from PLC (programmable Logic Controllers) to IoT devices to manage and monitor their sensors. For commercial use some of these alternatives are more popular than others. There are also a large amount of different higher level protocols like MQTT, HTTP and SNMP that can be used to manage and monitor sensors. We propose using the NETCONF protocol with YANG sensor models for management. This work will be done in collaboration with Lightside Instruments AS.

This document will cover the following three topics:

- **Work methodology:** An indept analysis of the knowledge base around work methods like Scrum, Kanban, and Waterfall. With a focus on how our work methodology differs from these.

- **NETCONF and YANG sensor management**: A qualitative analysis of the NETCONF and YANG protocols and how they can be used to manage sensors.

- **NETCONF Security**: A qualitative analysis of the security aspects of the NETCONF protocol.

2 Lightside Instruments AS

Lightside Instruments is a company specializing in developing instruments with model based network management for use in networking, network interconnect testing and telemetry. They design their instruments with YANG (RFC7950) models and NETCONF (RFC6241) [4] protocol. The instruments are based on IETF standards and drafts, and are implemented with software tools available in Debian, programmable logic and open hardware. [8]

3 Technical background

3.1 NETCONF and YANG

NETCONF [4] is a model based Network Configuration Protocol. Each NETCONF device presents the aquiring device with a YANG [3] data model con-

sisting of the device state and parameters. Each data model has a set of constraints making them error correcting.

4   Work methodology

4.1   Research Question

This meta study examines the claims that Scrum, Kanban, Waterfall, Extreme Programming and DevOps increases worker productivity substantiated by empirical evidence.

4.2   Scoping Review

4.2.1   Search strategy

The following is our search strategy for the scoping review. We will be searching for quantitative studies on the efficiency of the following work methodologies:

- Scrum

- Kanban

- Waterfall

- Extreme Programming

- DevOps

We will be searching the following databases:

- IEEE Xplore [7]

- ACM Digital Library [1]

- Google Scholar [5] (Meta database)

We will also be searching the following industry websites:

- Agile Alliance [2]

- Scrum.org [6]

- DevOps Institute [9]

- Scrum Alliance [11]

Our search will consists of a set of primary and secondary keywords. The primary keywords are:

- Scrum

- Kanban

- Waterfall

- Extreme Programming

- DevOps

The secondary keywords are:

- Effectiveness

- Efficiency

- Productivity

- Performance

- Success

- Failure

The search will be done using the following search string:

```
(Scrum OR Kanban OR Waterfall OR "Extreme Programming" OR DevOps)
                                AND
(Effectiveness OR Efficiency OR Productivity OR Performance OR Success OR Failure)
```

4.2.2 Inclusion and Exclusion Criteria

The systematic review will include peer-reviewed articles meeting the following criteria:

- Published after January 1, 2020

- Evaluating the effectiveness of the following methodologies:

5   NETCONF and YANG sensor management

6   NETCONF Security

Identification
Records identified through database searching:
IEEE Xplore (n = 20)
ACM Digital Library (n = 20)
Google Scholar (n = 20)
Total (n = 60)

Screening
Records after duplicates removed
(n = 54)

Records screened by title and abstract
(n = 45)

Records excluded
(n = 9)

Eligibility
Full-text articles assessed for eligibility
(n = 30)

Full-text articles
excluded, with reasons:
- Not focused on
methodology (n = 8)
- Not software development (n = 3)
- Conference abstracts only (n = 2)
- Other (n = 2)

Included
Studies included in meta analysis
(n = 15)

Scrum	(n = 6)
Kanban	(n = 2)
Waterfall	(n = 1)
Extreme Programming	(n = 1)
DevOps	(n = 5)

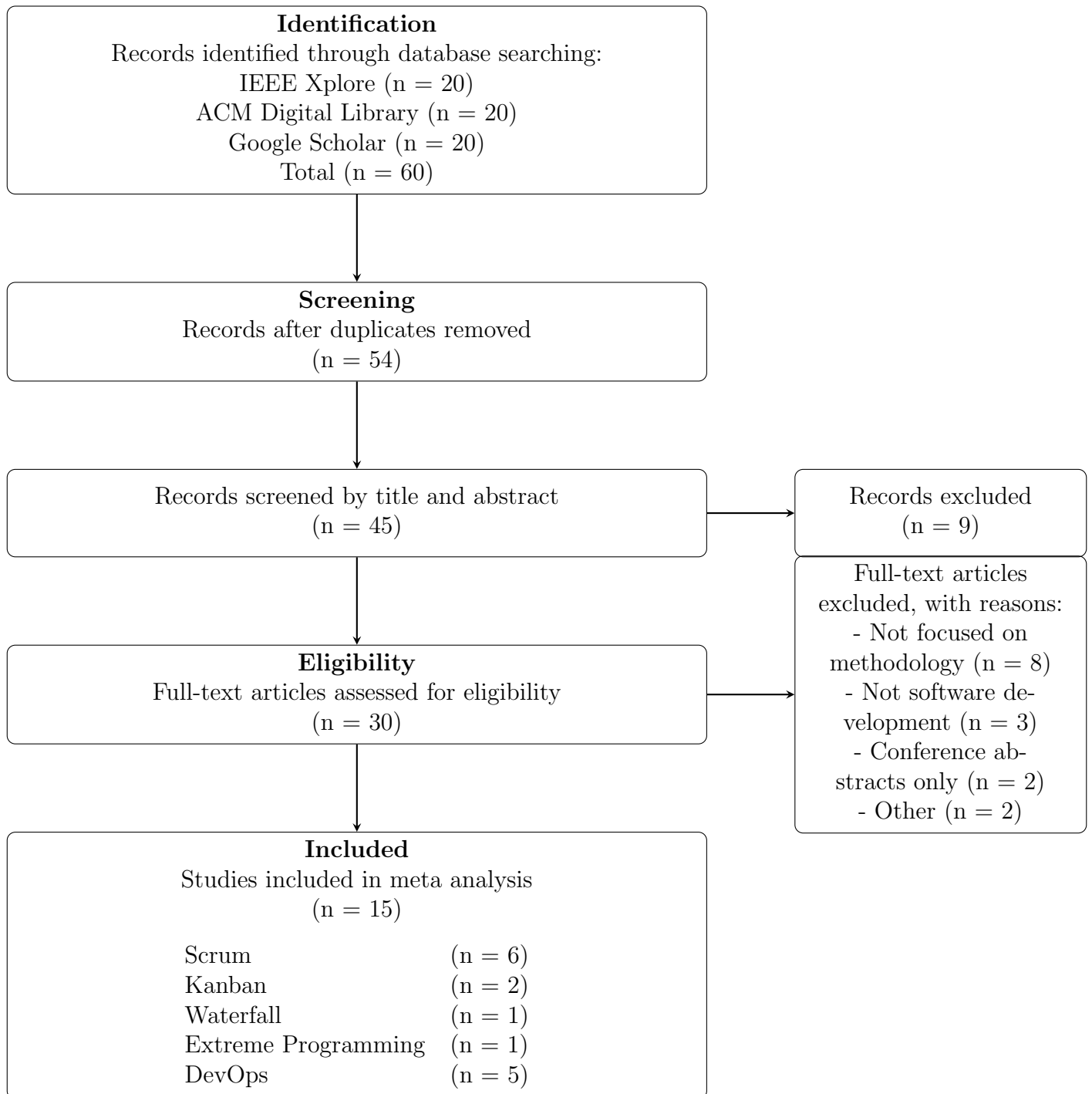*Figure 1:* PRISMA [10] flow diagram for scoping review of software development methodologies

References

[1] *ACM Digital Library*. https://dl.acm.org/. (Visited on 03/28/2025).

[2] *Agile Alliance*. https://www.agilealliance.org/. June 2015. (Visited on 03/28/2025).

[3] Martin Björklund. *The YANG 1.1 Data Modeling Language*. Request for Comments RFC 7950. Internet Engineering Task Force, Aug. 2016. DOI: 10.17487/RFC7950. (Visited on 01/12/2025).

[4] Rob Enns et al. *Network Configuration Protocol (NETCONF)*. Request for Comments RFC 6241. Internet Engineering Task Force, June 2011. DOI: 10.17487/RFC6241. (Visited on 01/12/2025).

[5] *Google Scholar*. https://scholar.google.com/. (Visited on 03/28/2025).

[6] *Home — Scrum.Org*. https://www.scrum.org/index. (Visited on 03/28/2025).

[7] *IEEE Xplore*. https://ieeexplore.ieee.org/Xplore/home.jsp. (Visited on 03/28/2025).

[8] *Lightside Instruments AS – YANG Model Network Managed Instruments*. (Visited on 01/20/2025).

[9] *Organisations-*. https://www.peoplecert.org/Organisations. (Visited on 03/28/2025).

[10] *PRISMA Statement*. https://www.prisma-statement.org. (Visited on 03/28/2025).

[11] *Scrum Alliance - Find Courses for Scrum and Agile Certifications*. https://www.scrumalliance.org. (Visited on 03/28/2025).