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.

Writer's note: *unprecise, replace: "can use anything from..." and all other vague statements.*

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 [9].

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.

3.2 Node-RED

Node-RED [10] is an open source low code programming tool for event driven applications. It is developed by IBM and is based on Node.js [11]. Node-RED is used to connect hardware devices and APIs through a visual programming interface.

3.3 Grafana

Grafana [6] is an open source data visualization tool. It is used to visualize arbitrary data from different data sources.

4 Work Methodology

4.1 Research Question

This review 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 [8]
- ACM Digital Library [1]
- Google Scholar [5] (Meta database)

We will also be searching the following industry websites:

- Agile Alliance [2]
- Scrum.org [7]
- DevOps Institute [12]
- Scrum Alliance [14]

Writer's note: *This section becomes a bit monotone, consider fewer lists.*

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 Exclusion Criteria

The systematic review will include articles meeting the following criteria:

- Published after January 1, 2020
- Published in English
- Relevant to the research question
- Empirical evidence
- Quantitative studies
- On of the 20 first results from each database
- Evaluating the effectiveness of the following methodologies:
  - Scrum
  - Kanban
  - Waterfall
  - Extreme Programming
  - DevOps

4.2.3 Exclusion

After applying the exclusion criteria to a set of 60 articles, we discovered that 4 of them were duplicates. The 56 remaining articles were screened by title and abstract, resulting in 12 articles being excluded. The 44 remaining articles were assessed for eligibility, resulting in 33 articles being excluded. The 11 remaining articles were included in the review.

4.2.3.1 PRISMA flow diagram

Figure 1 shows the PRISMA [13] flow diagram for the scoping review. The PRISMA flow diagram is a standardized way of reporting the results of a scoping review.

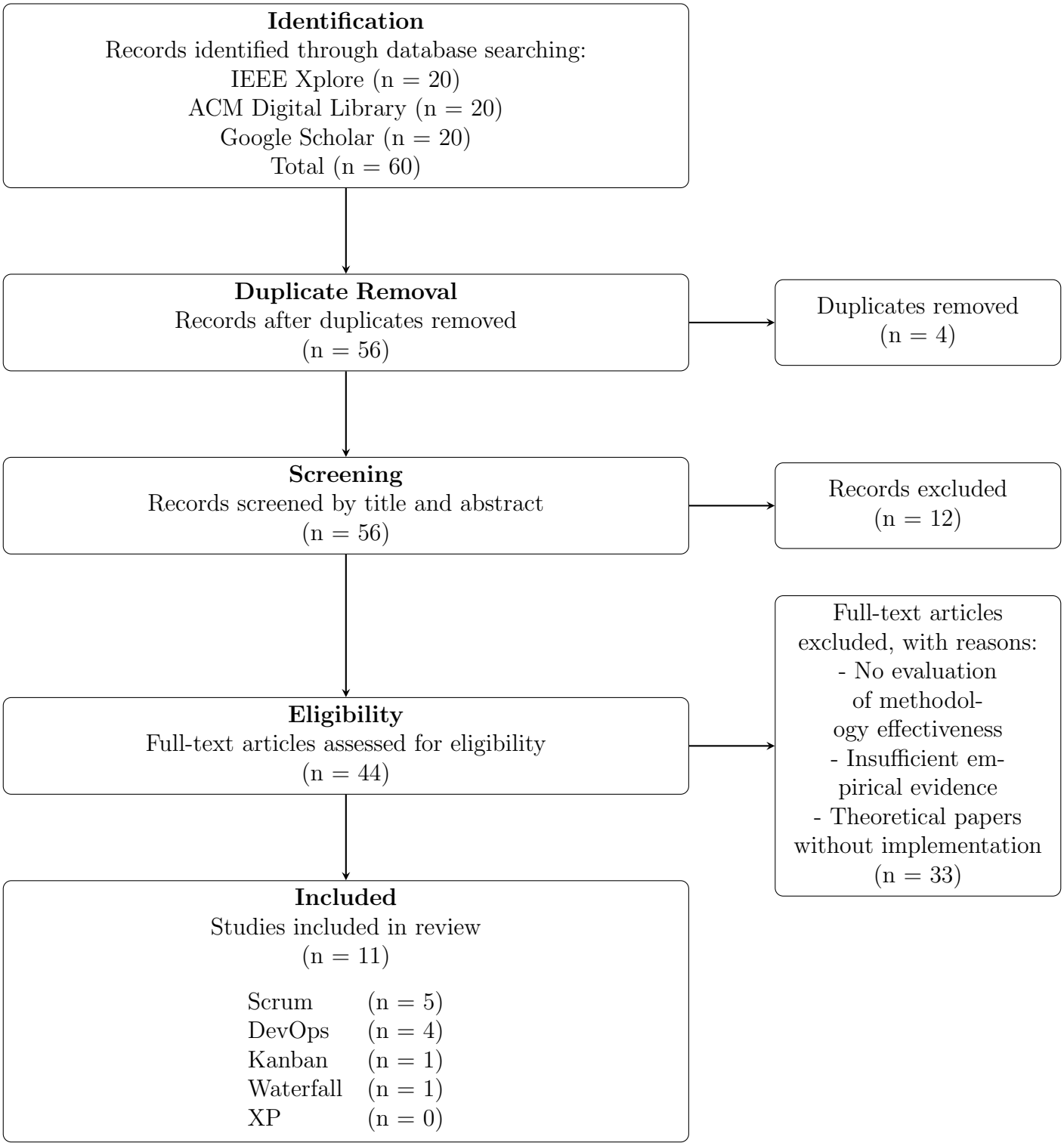

Figure 1: PRISMA flow diagram for systematic review of software development methodologies

References

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

[10] *Low-Code Programming for Event-Driven Applications : Node-RED*. https://nodered.org/. (Visited on 03/29/2025).

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