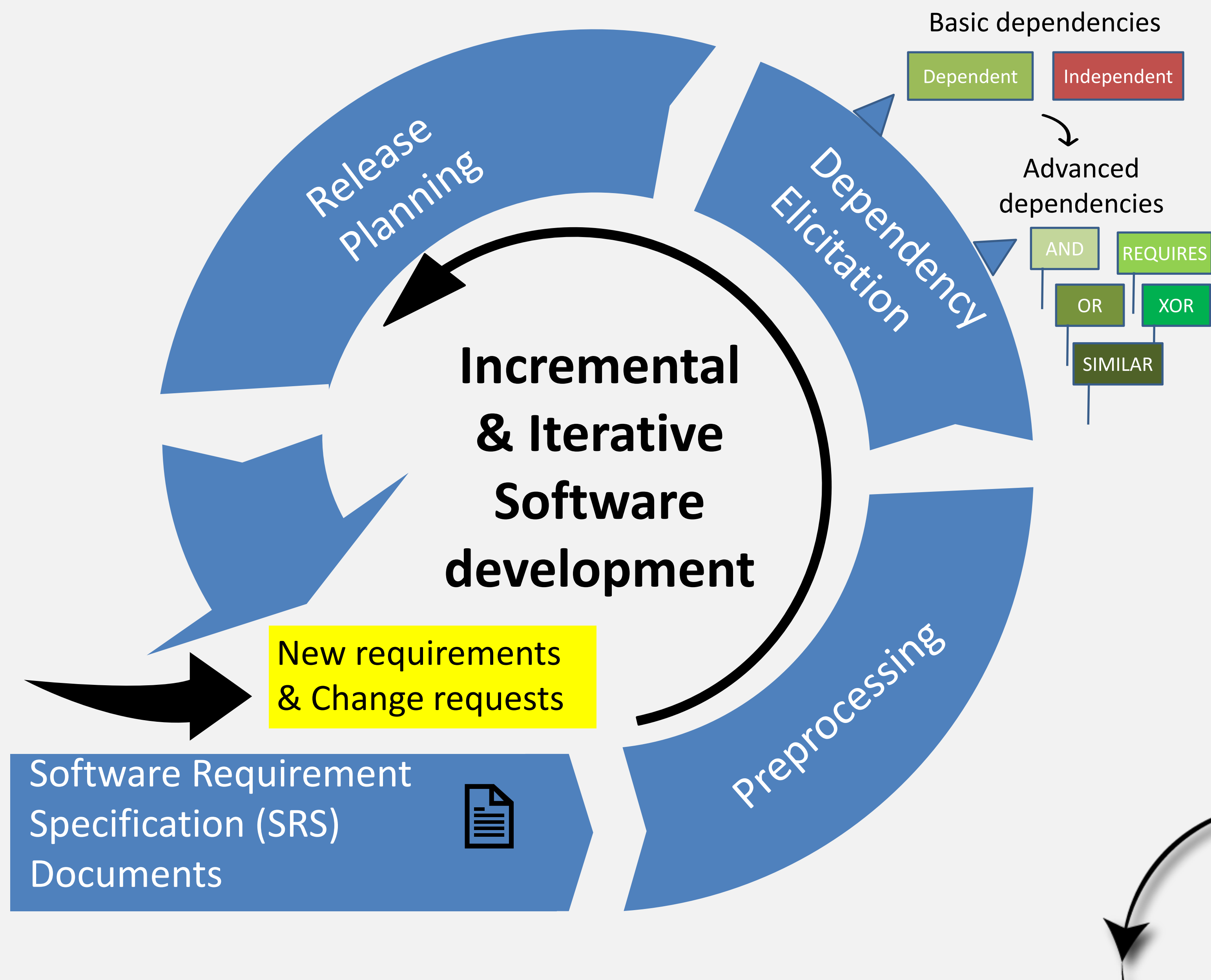


# SRe YANTRA : Requirement Inter-dependency Elicitation, Management and Analysis

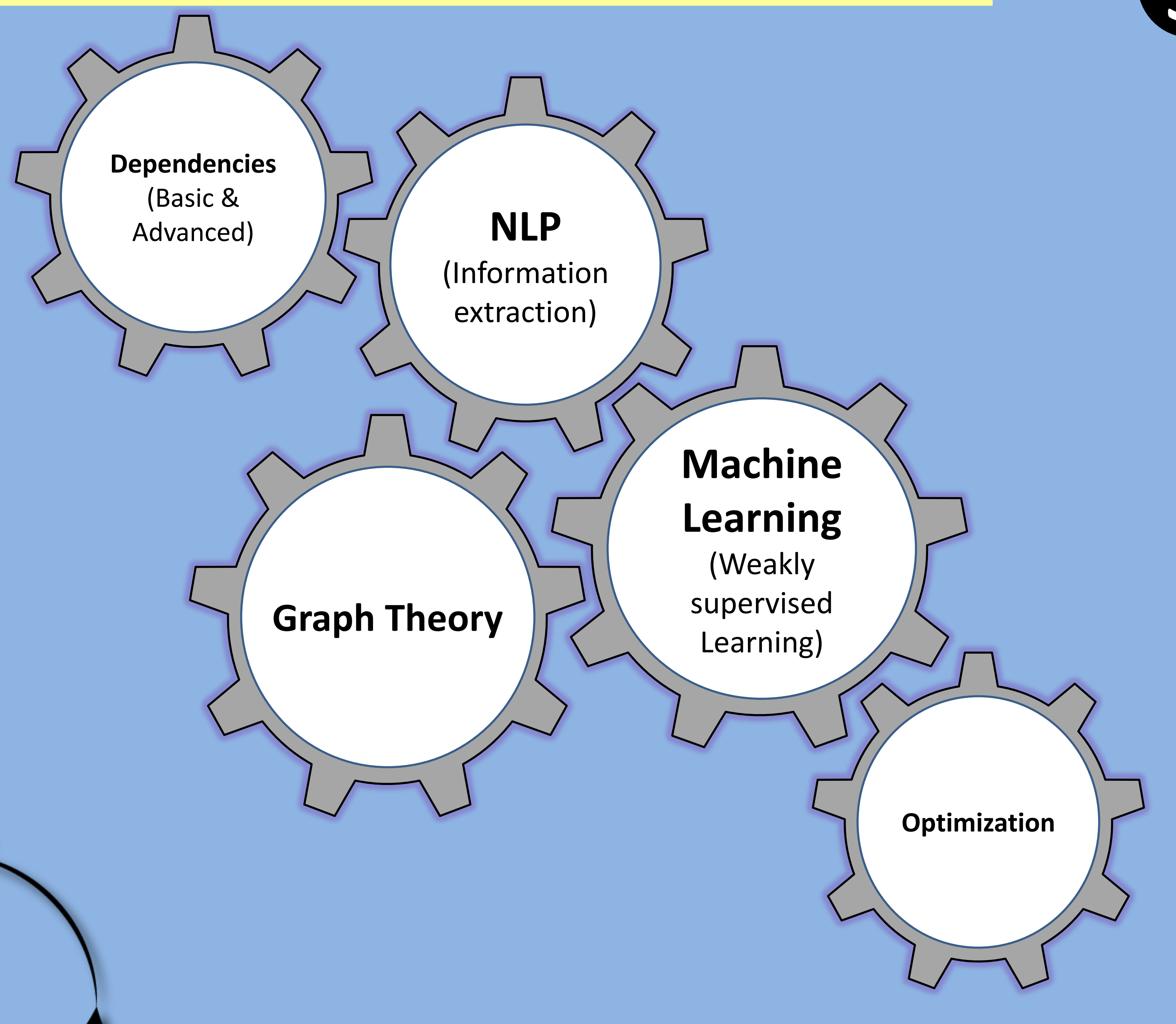
## Requirement Inter-dependencies Elicitation

1



## Approach

3

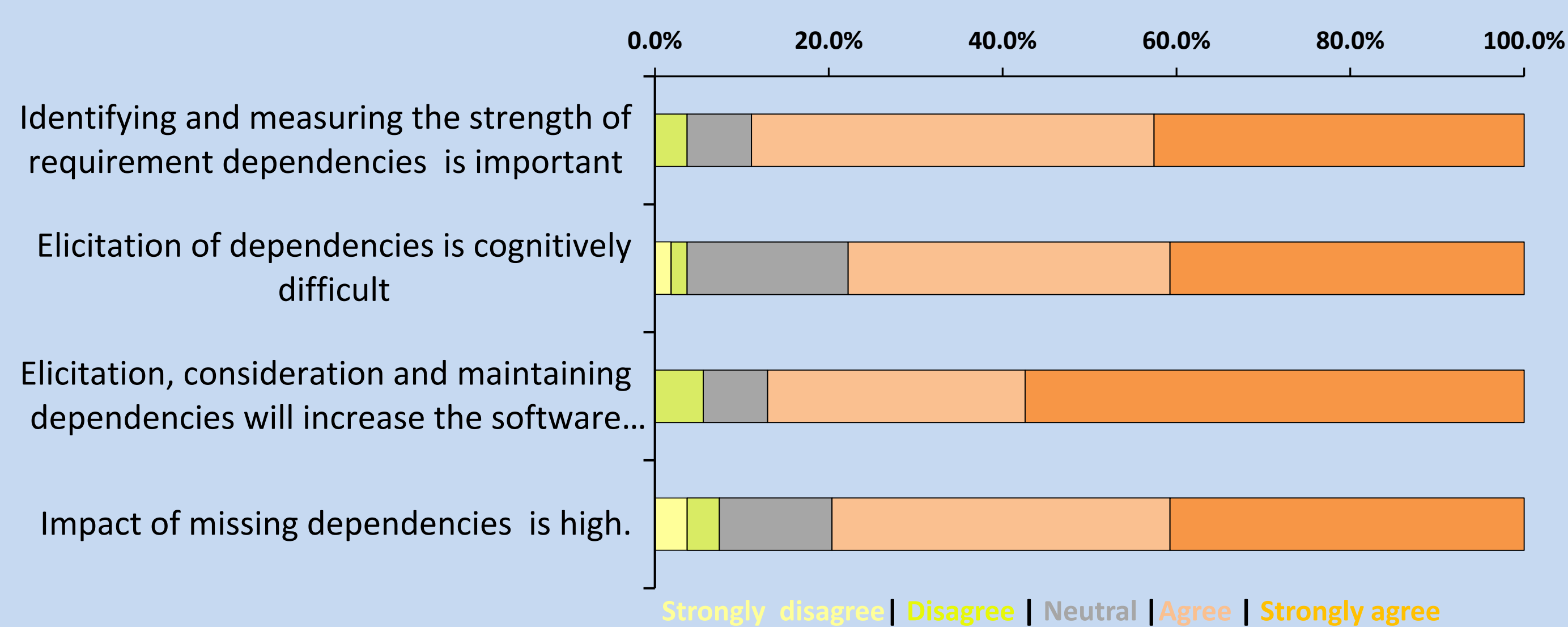


### Research questions:

- How accurate are Weakly Supervised Learning methods such as (Semi supervised and Active Learning) and Ontologies to elicit pair-wise Basic and Advanced dependencies?
- How effectively can we manage requirement inter-dependencies during evolution of the Software?
- How useful is Bio-inspired optimization for planning the Product Releases while considering all advanced dependencies?

### Motivation:

Results of perception of participants with respect to requirement inter-dependencies



Survey: [http://pages.cpsc.ucalgary.ca/~gouri.deshpande/Survey\\_2018.pdf](http://pages.cpsc.ucalgary.ca/~gouri.deshpande/Survey_2018.pdf)



2

## Methodology

## Conclusion & Future work

### Initial results provide good basis to

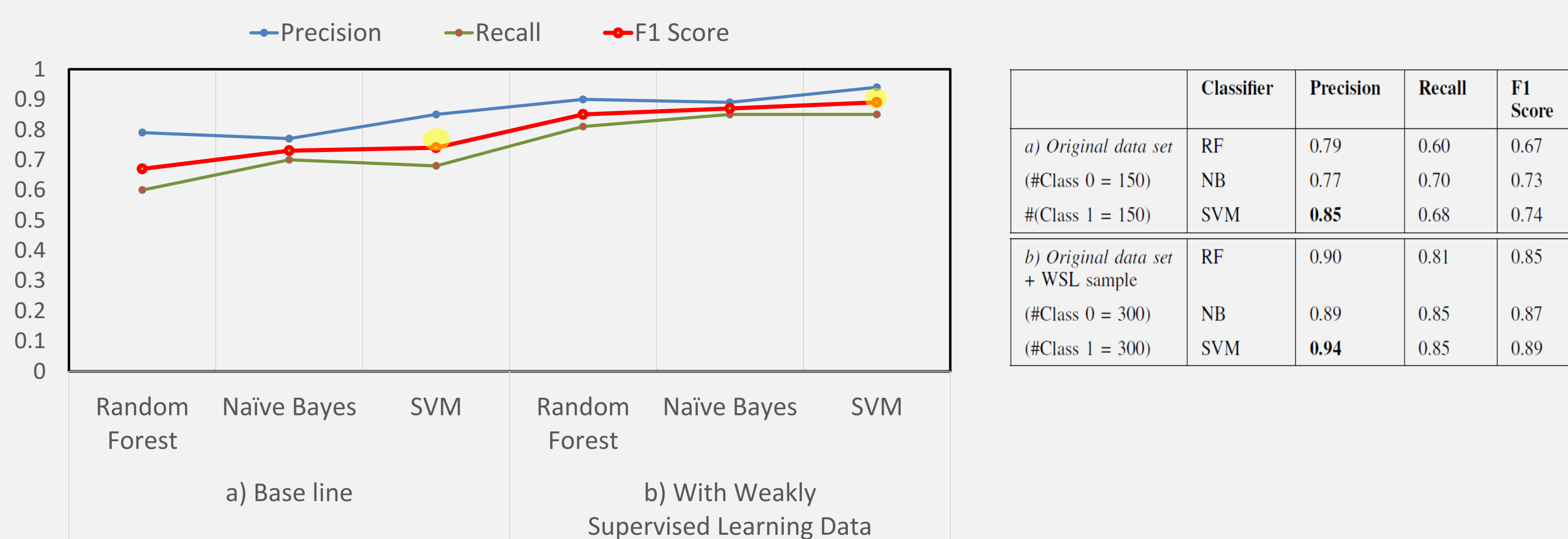
- Handle continuous updates (change requests and new requirements) and respective impact on dependencies.
- Consideration of general types of dependencies

### Future work

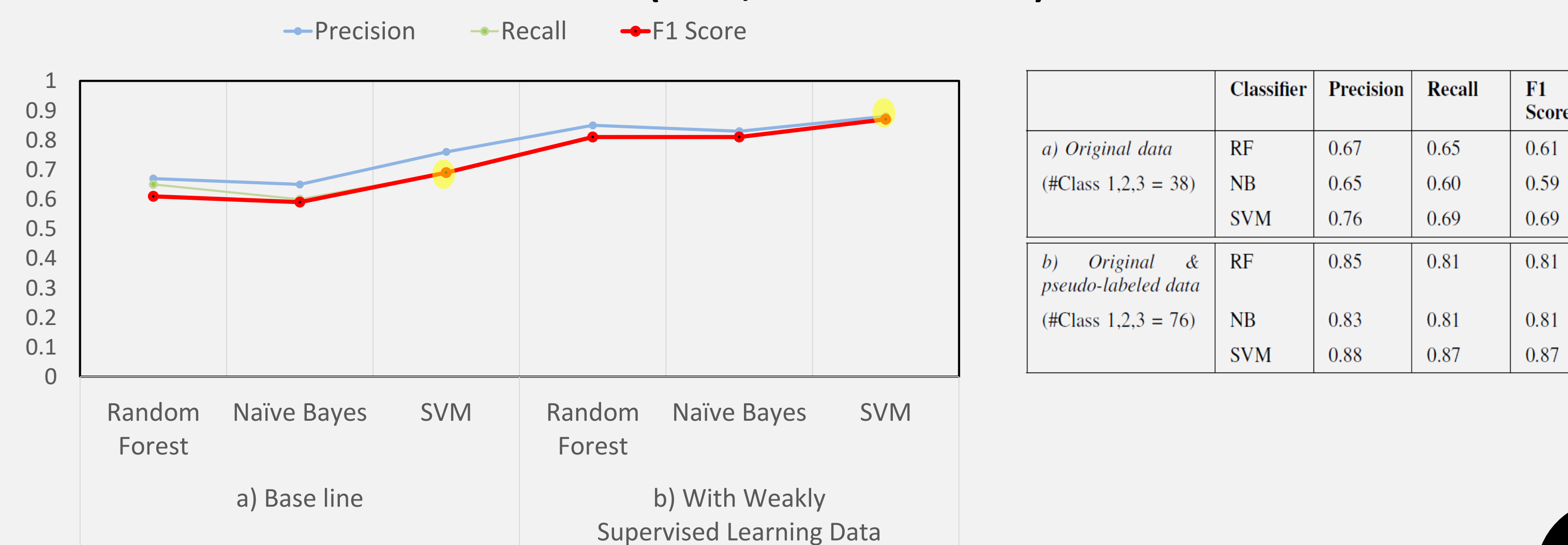
- Perform additional tests using multiple SRS documents [6]
- Utilize multi-class classifiers to identify all the dependency types.
- Utilize Bio-inspired optimization for Product Release Planning.

Average classifier accuracy from 10 times 10-fold CV before (a) and after (b) utilizing pseudo-labelled data using Weakly Supervised Learning to identify Basic and Advanced dependency types.

### Baseline Vs Weakly Supervised Learning for Basic dependency types (Dependent and Independent)



### Baseline Vs Weakly Supervised Learning for Advanced dependency types (AND, OR & SIMILAR)



## Results

4

## References

- [1] G. Deshpande. SReYantra: Automated Software Requirement Inter-dependencies Elicitation, Analysis and Learning. Doctoral Symposium, International Conference on Software Engineering, 2019 (Accepted)
- [2] G. Deshpande, C. Arora and G. Ruhe. Data-driven Elicitation and Optimization of Dependencies between Requirements, Requirement Engineering Conference, 2019 (Submitted)
- [3] P. Carlshamre. Release planning in market-driven software product development: Provoking an understanding. Requirements engineering, 7(3):139–151, 2002
- [4] M. Nayeji and G. Ruhe. Optimized functionality for super mobile apps. In 2017 IEEE 25th International Requirements Engineering Conference (RE), pages 388–393. IEEE, 2017.
- [5] M. R. Karim and G. Ruhe. Bi-objective genetic search for release planning in support of themes. In Proc. SSBSE, pages 123–137. Springer, 2014
- [6] A. Ferrari, G. O. Spagnolo, and S. Gnesi. Pure: A dataset of public requirements documents. In Requirements Engineering Conference (RE), 2017 IEEE 25th International, pages 502–505. IEEE, 2017