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Can data utilization from laboratory production systems be a way to increase employee satisfaction and quality?

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A PhD study

Introduction

There is a lack of biomedical laboratory scientist workforce, and the profession is substituted with other professions(1)(3).

Studies indicate that blood sampling is a complex assignment(7), and **reoccurring errors** appears to be important for work satisfaction(8–10), as well as patient safety. A greater utility of production data in the future to support this field, by following through of **Healthcare 4.0** thinking with greater interconnectivity and big data utilization into smart solutions for employees, can be an interesting approach, to make a practical and holistic innovation in this field(11).

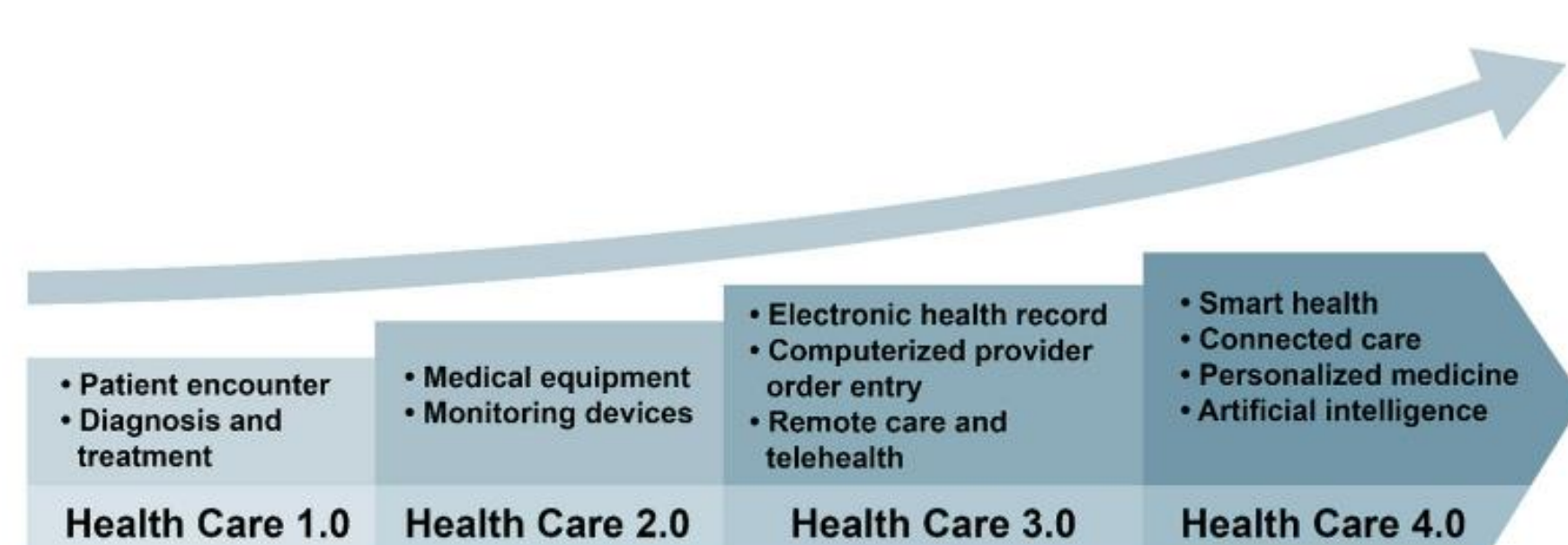


Figure 3. Historical evolution of health care 1.0 to Health Care 4.0.

Displayed with approval from: Jingshan Li and Pascale Carayon: Health Care 4.0: A vision for smart and connected health care. IISE TRANSACTIONS ON HEALTHCARE SYSTEMS ENGINEERING. 2021.

Quality improvement

Productivity in public hospitals is monitored through *national health goals*, to compare and learn(4), and *quality measures* are used in this field(4,5).

Healthcare Quality Improvement is linked closely to productivity terms: *performance, efficiency, and health systems performance*(5). Frameworks to improve quality are complex, and there is a lack of specific recommendations(5,6). Patient safety, accreditation and public reporting(UTH-system) are used as quality systems and learning systems in Denmark(5), **without explicit employee satisfaction perspectives**.

The ISO system indicators as well as new technologies must be implemented on the departments' own initiatives and resources, and new perspectives can be hard to find on complex problems as *work satisfaction* among employees.

Feedback is essential to learn

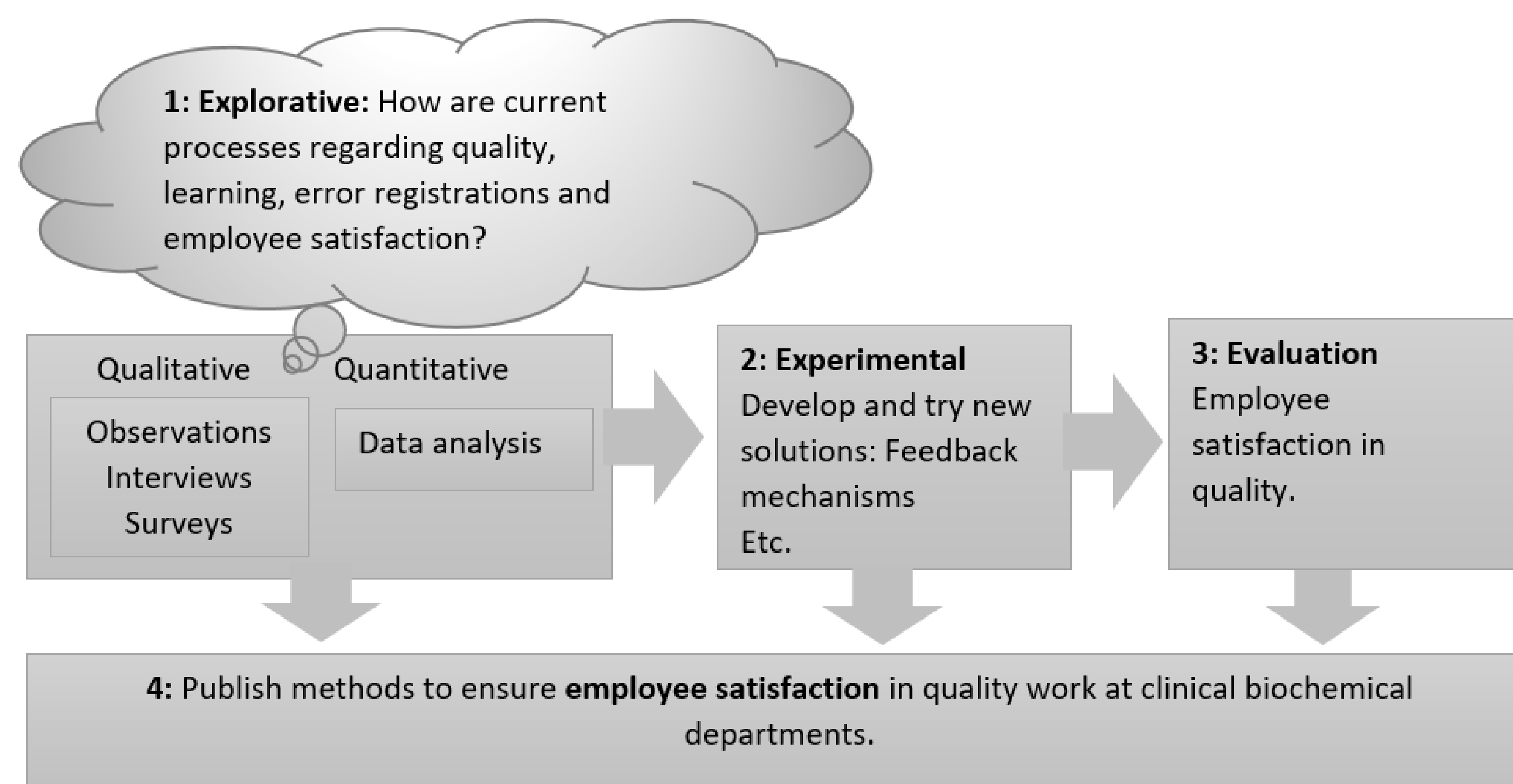
According to interpretation of theoretics from the field of Social Systems Theory, Ane Qvortrup suggests that: **To accomplish learning, feedback is needed**. Inconsistent one-way communication out of time and place of context, only has a low learning potential(12).

Interfaces in laboratory production are tracing the sample and creating an analysis answer. **The sampler has no insight into own performance on a daily basis**. Feedback is not continuous- or data supported, and registration of errors(UTH) can be scare, due to public reporting in a separate system(13). **Utility of production data** has a potential to create consistent feedback-mechanisms, to employees knowledge on own performance, as well as learning(14). I suggest that current data can support these fields in a greater way in the future.

How can quality methods in clinical departments secure employee satisfaction and quality?

- How can process level measurements be created and supported, based on laboratory data in the preanalytical phase of clinical biochemistry departments?
- How can utility of production data contribute to support ongoing learning, consistent feed-back and greater work satisfaction among employees?

Methods



Results

Quantitative: There might be a rate of essential registrations in the field of clinical biochemistry **that we do not react to today**, which can be important to quality. The systems are made to create analysis results and with less focus on employee perspectives, feedback and learning and quality.

Trying out **new feedback mechanisms** in information systems is possible to have positive effects on employee satisfaction, and transparency regarding quality. Data from production systems will be used from one or more case-settings, in line with **Healthcare 4.0 thinking**.

Conclusions

The thesis will make a contribution with **new specific quality recommendations**, including *work satisfaction* and quality monitoring through field- and case- based knowledge, including employees and production data.



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