Using DIMS for Real-Time Monitoring of Patient Dietary Intake and Plate Waste: A Pilot Study at Herlev Hospital
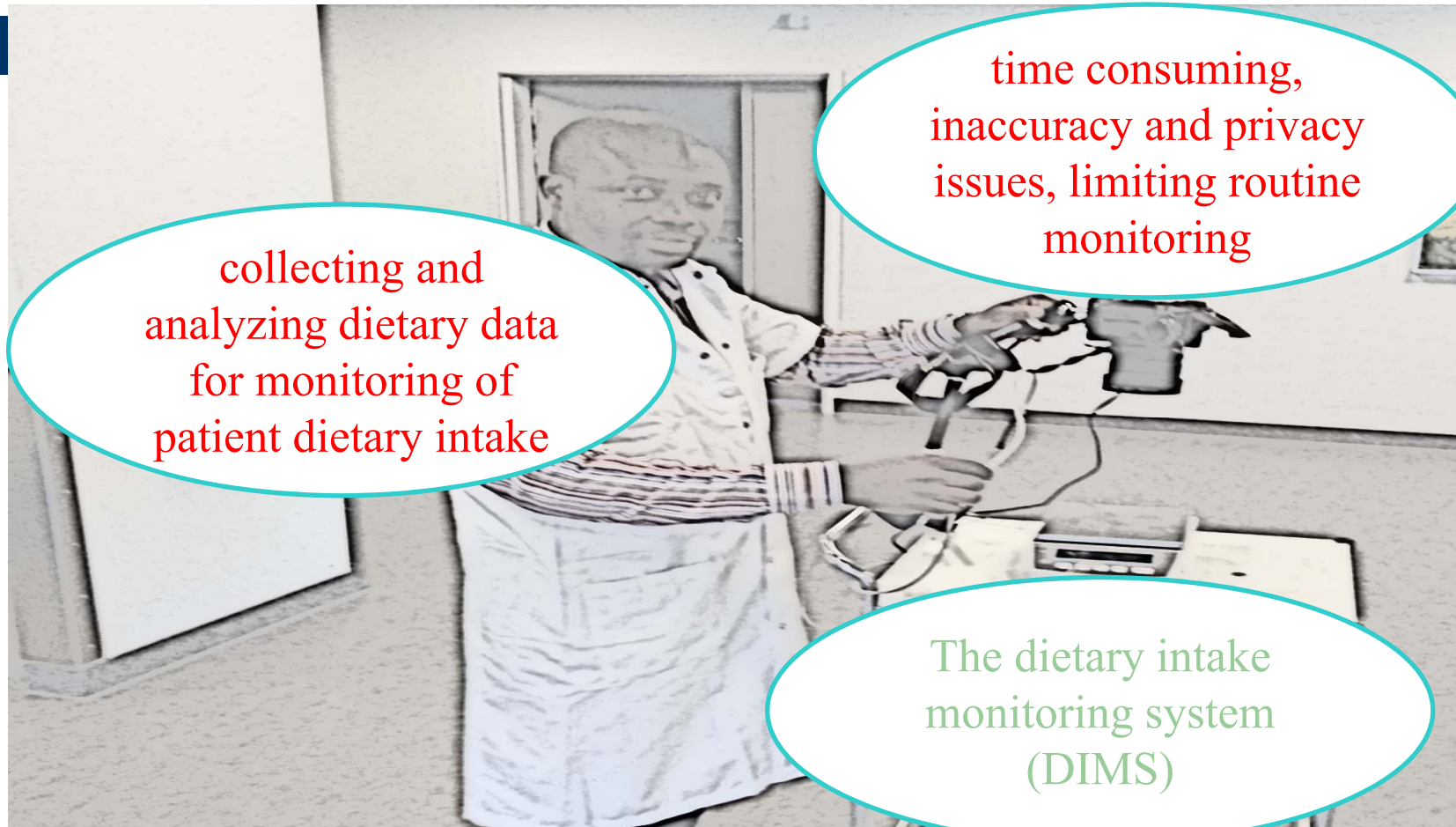
Kwabena Titi Ofei, *Ph.D*

Bent Egberg Mikkelsen, Professor, PhD

DIMS
Dietary Intake
Monitoring System

dVices 4 Food
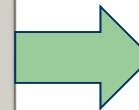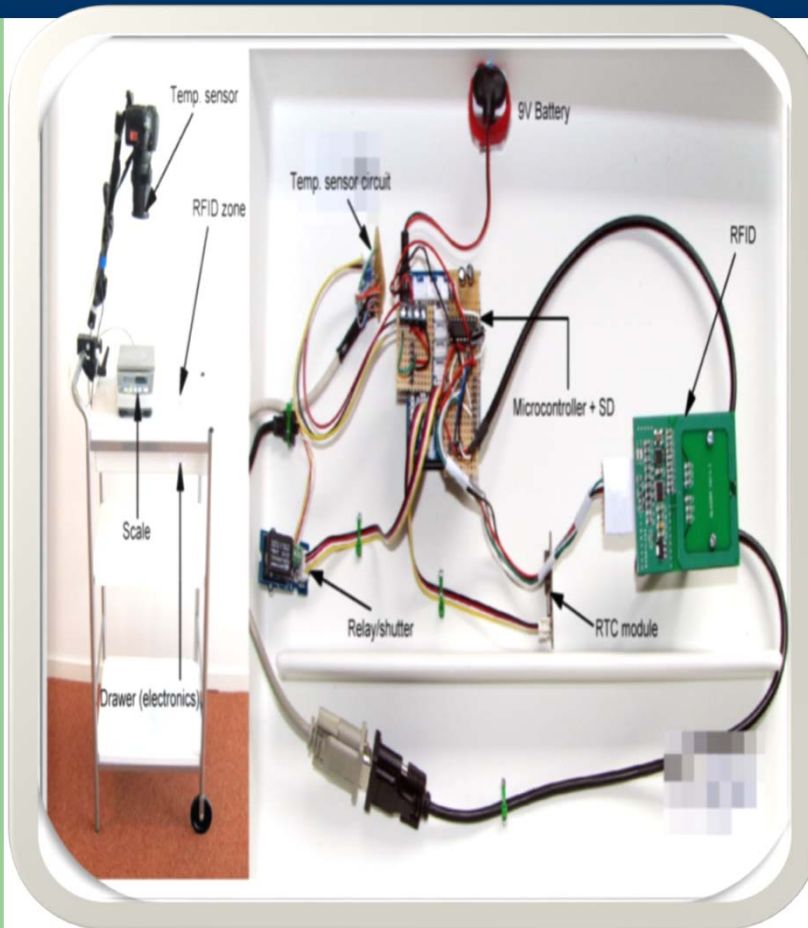
AALBORG UNIVERSITY
DENMARK

Introduction

Aims

- This paper presents the development and the feasibility of using the DIMS 2.0

- for the purpose of real-time monitoring of patient dietary intake and plate waste.

- in a study aimed at evaluating a new meal serving system at Herlev hospital.
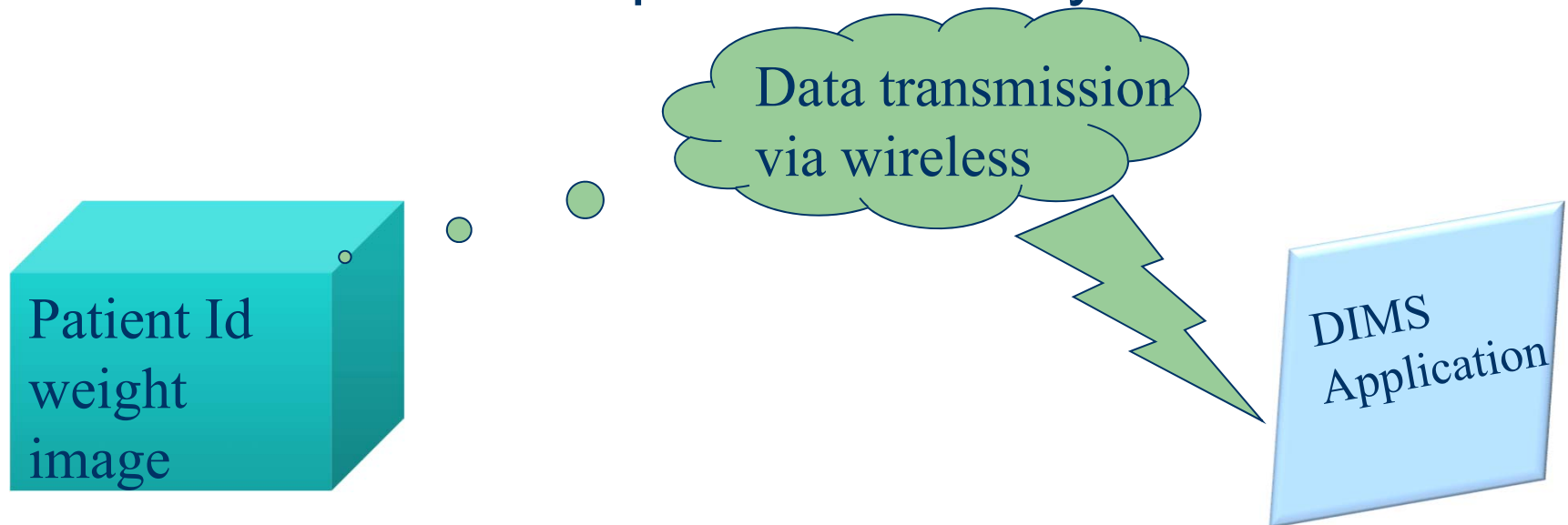
Development of DIMS (1.0 to 2.0)

What is new about the DIMS 2.0

- Real-time data capture and analysis

Data transmission via wireless

Patient Id weight image

DIMS Application

Automatizing real-time data analysis

- For monitoring of dietary intake and plate waste

- How ?

  Using DIMS application (on tablet) for real time
  - **View cases**
  - **Meal analysis**
  - **Waste analysis**
  - **User interactive analysis**

Overview of the application on tablet

List of meals

| | Refresh view | Meals | Export Meal data | Export Meal pictures | Meal analy: |
| Waste analysis | Turn off | | | | |

ID	Date and time	Identification	Weight	Pictures	Options	
448	2016-05-09 15:35:25		387 g	3	Picture list	Run N
447	2016-05-09 12:11:04		18 g	3	Picture list	Run N
446	2016-04-28 13:20:50	02572DED	405 g	3	Picture list	Run N

IMS NU3

Match results

| Refresh view | Meals | Meal analysis | Waste analysis | Total consumption: 4843 g |

Identification	P-Weight	Pre-weight	Post-weight	Time span	Pre-date	Post-date	IDs	Options

Meal analysis output on the tablet

Interactive interface- User input

- Application: co-creational mode
- Interactive interface
  - **User can add inputs**
  - **improve accuracy portion size estimation**

Portion consumed

Before Consumption Photo

After Consumption Photo
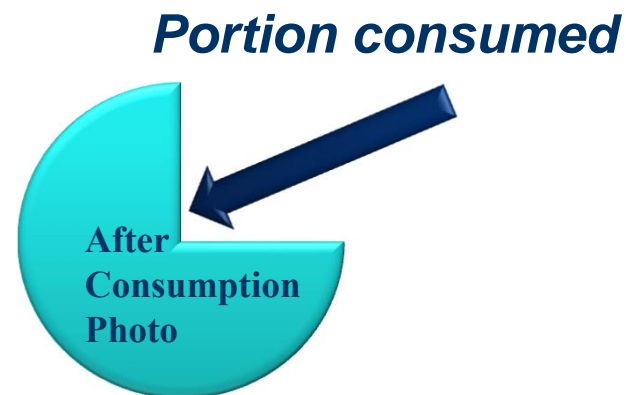
Methods

- Prospective study
  - **Medical & surgical wards.**
  - **9 weekdays in the pre implementation phase**

- DIMS 2.0
  - **Collect paired before and after photos & weight of plate**

- Ethical consideration
  - **Patients oral consent.**

Results

- Real-time data of 74 plate contents before and after were captured on the mobile tablet
  - portion consumed
  - plate waste
  - 2 minutes time frame for generating a complete patient dietary report.

View case

Identification	P-Weight	Pre-weight	Post-weight	Time span	Pre-date	Post-date	IDs
A26D2AED	85 g	111 g	26 g	00:12:45	2016-02-09 12:07:55	2016-02-09 12:20:40	11 / 19

Pre-pictures (111 g)   Post-pictures (26 g)

Measurement of effect of the new meal serving system on food waste reduction in a pilot

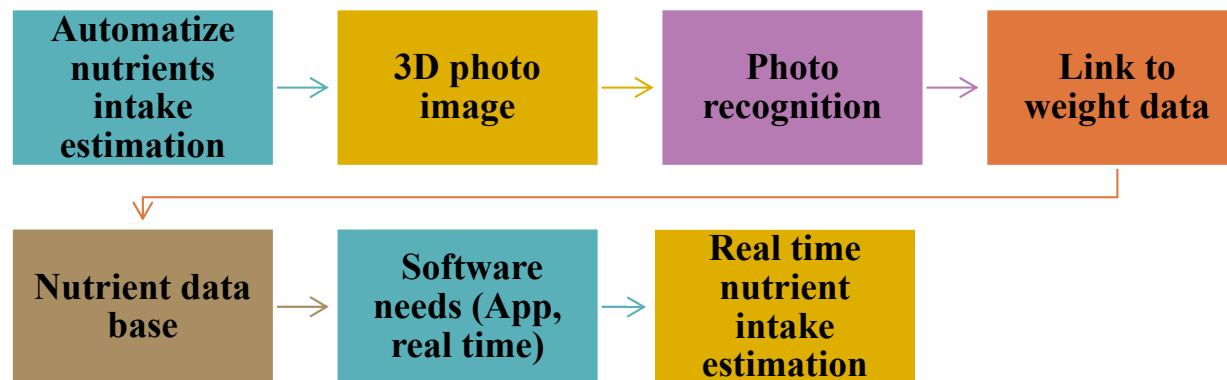| Meal serving system	Portion served (g)	Portion consumed (g)
Pre (n=36)	308 (± 123)	64(± 58)
Post (n=38)	343(± 106)	71 (± 63)
P value	0,19	0,58

Conclusion

- DIMS 2.0 application facilitates a real-time monitoring of patient dietary intake and plate waste.

- Allows an investigator to have a quick and efficient overview of a patient with inadequate food intake.

- Photos of before and after meal servings can be used for guiding improved personalized meal serving.

Where are we?

- Automatize real-time monitoring of nutrient intake
    - **How:**

Automatize nutrients intake estimation	→	3D photo image	→	Photo recognition	→	Link to weight data

Nutrient data base	→	Software needs (App, real time)	→	Real time nutrient intake estimation

Research Team

Prof Bent Mikkelsen, *(Aalborg University)*

Michal Dobroczynski *(syscore ApS)*

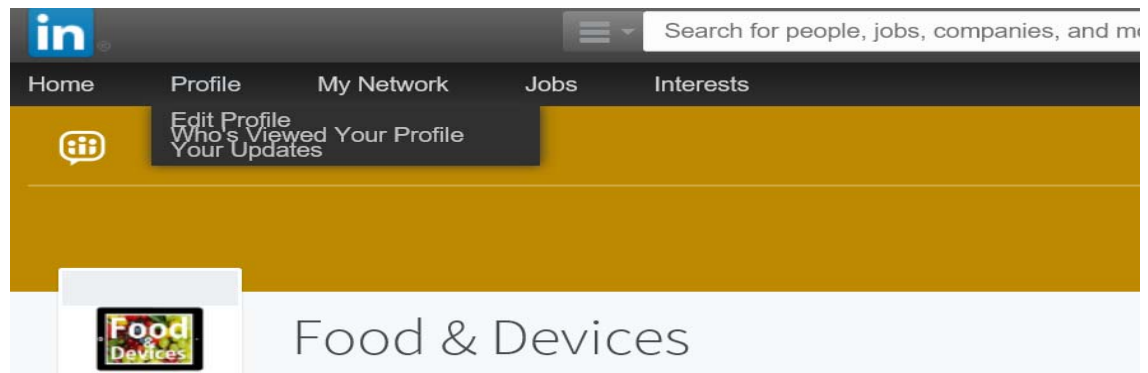Tanga Andersen (MSc. Student, IFS- AAU)

Acknowledgements

-Herlev Hospital Staff

-Patients who participated in the study

-FoodSerVInSIRE, Foodtura

Thanks. Stay updated?

- Register for the Food & Devices Special Interest Group at Linked In
- Receive updates on a regular basis
- Stay tuned for the COST action planning

July 6-7, Preconference: July 5

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10th ICCAS 2017 Copenhagen
Exploring Future Foodscapes

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