The Dietary Intake Monitoring System (DIMS)

An Innovative Device for Capturing Patient's Food Choice, Food Intake and Plate Waste in a Hospital Setting.

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Introduction

25 % of patients are malnourished

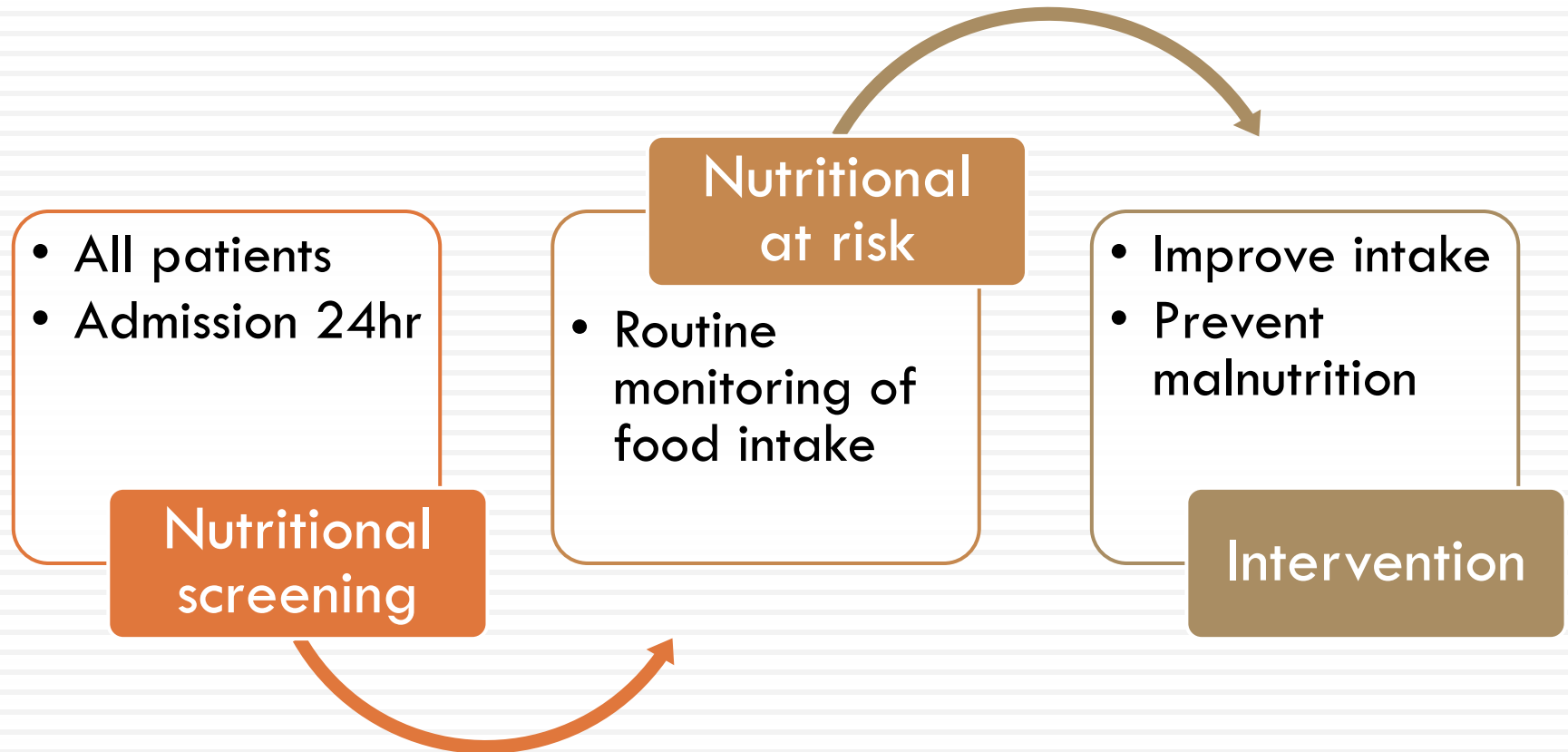Enough food for all patients

Up to 50% Food is wasted
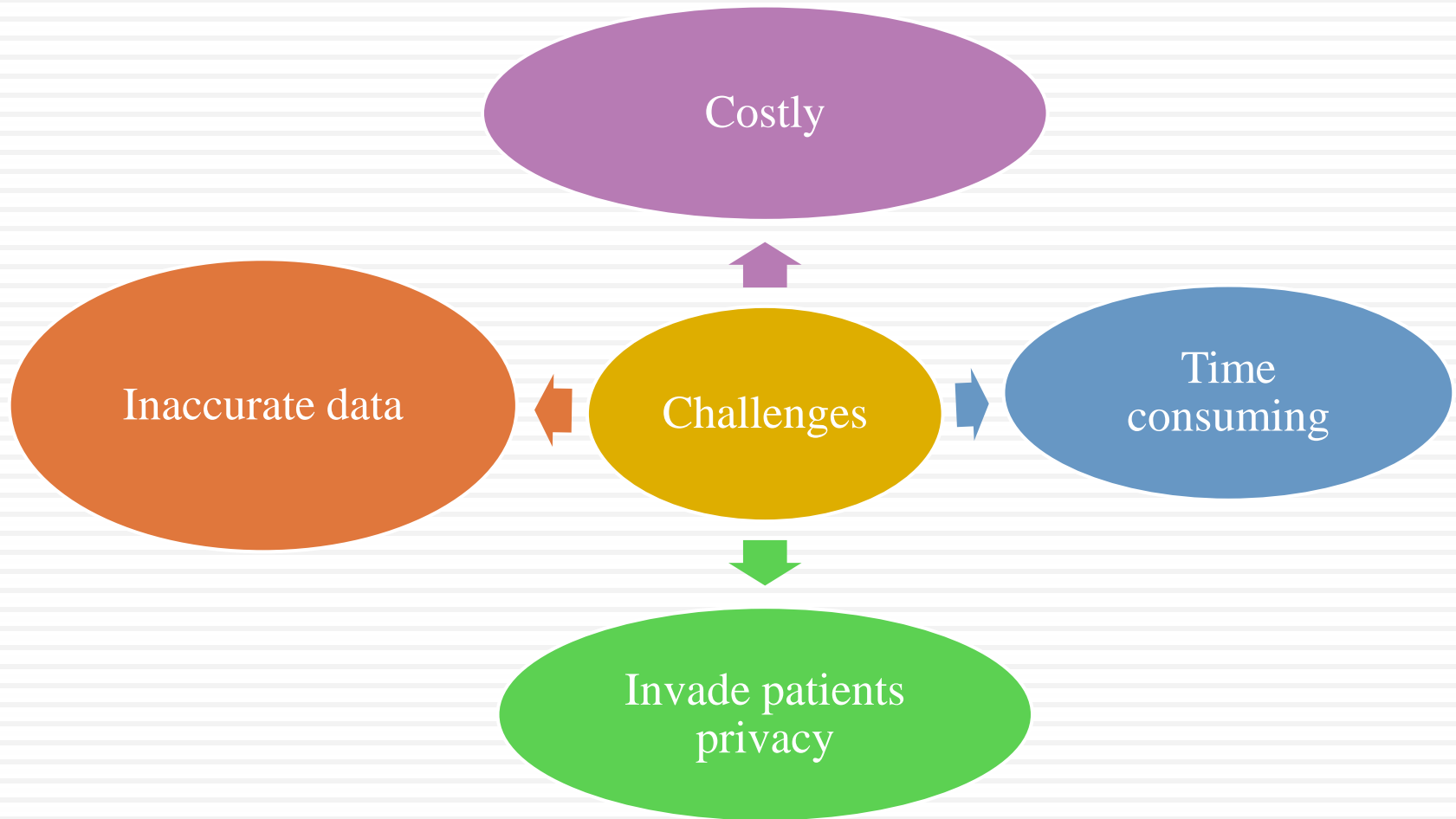
Mortality.

Prolong length of stay

Increase health cost

Routine monitoring as requirement in a hospital setting

- All patients
- Admission 24hr

Nutritional screening

Nutritional at risk

- Routine monitoring of food intake

- Improve intake
- Prevent malnutrition

Intervention

Current tools, methods for routine monitoring of food intake

- Weighed method
- 24hr recall,
- 7 day food record
- FFQ's

Challenges with the current Tools/methods
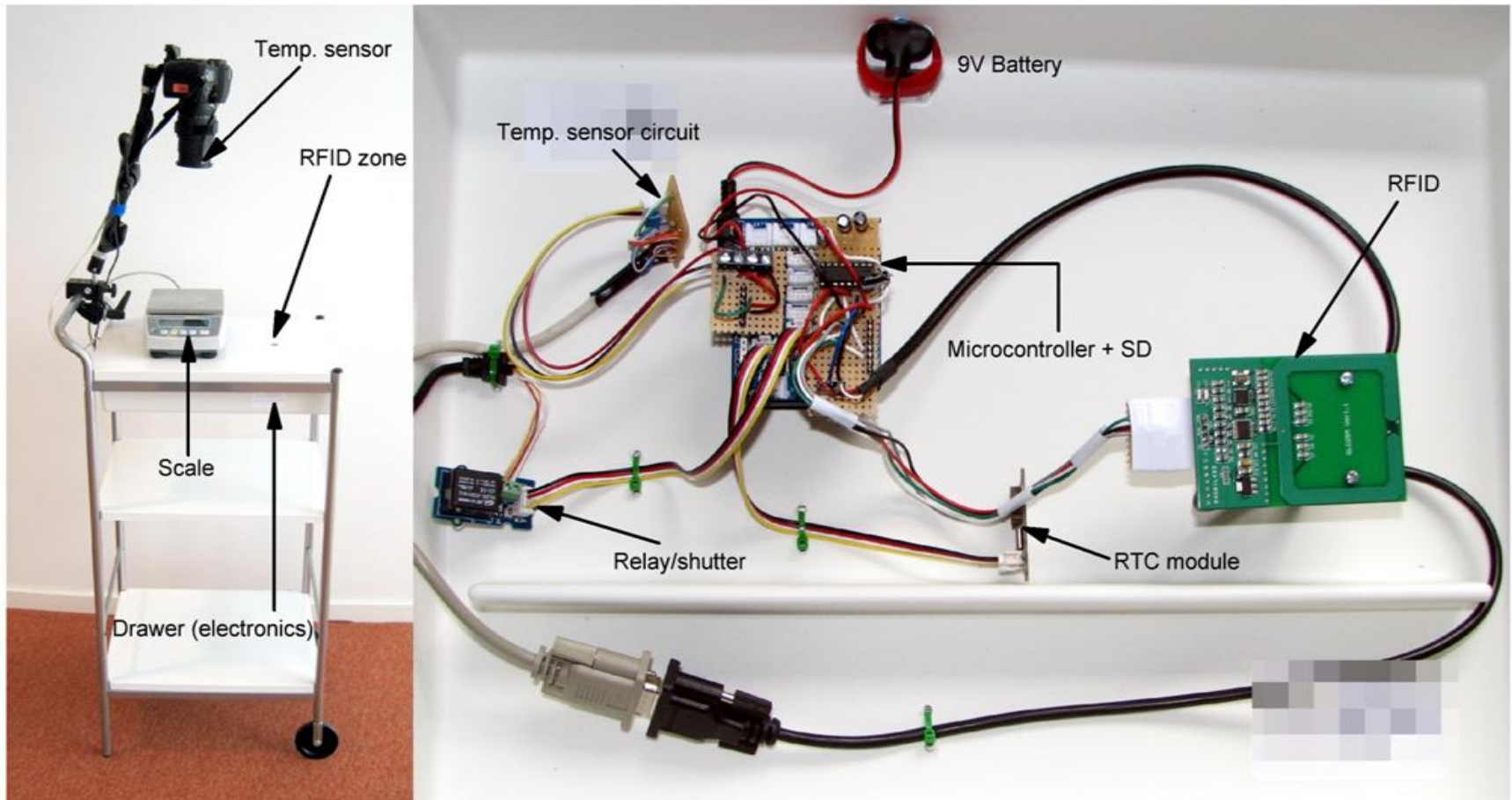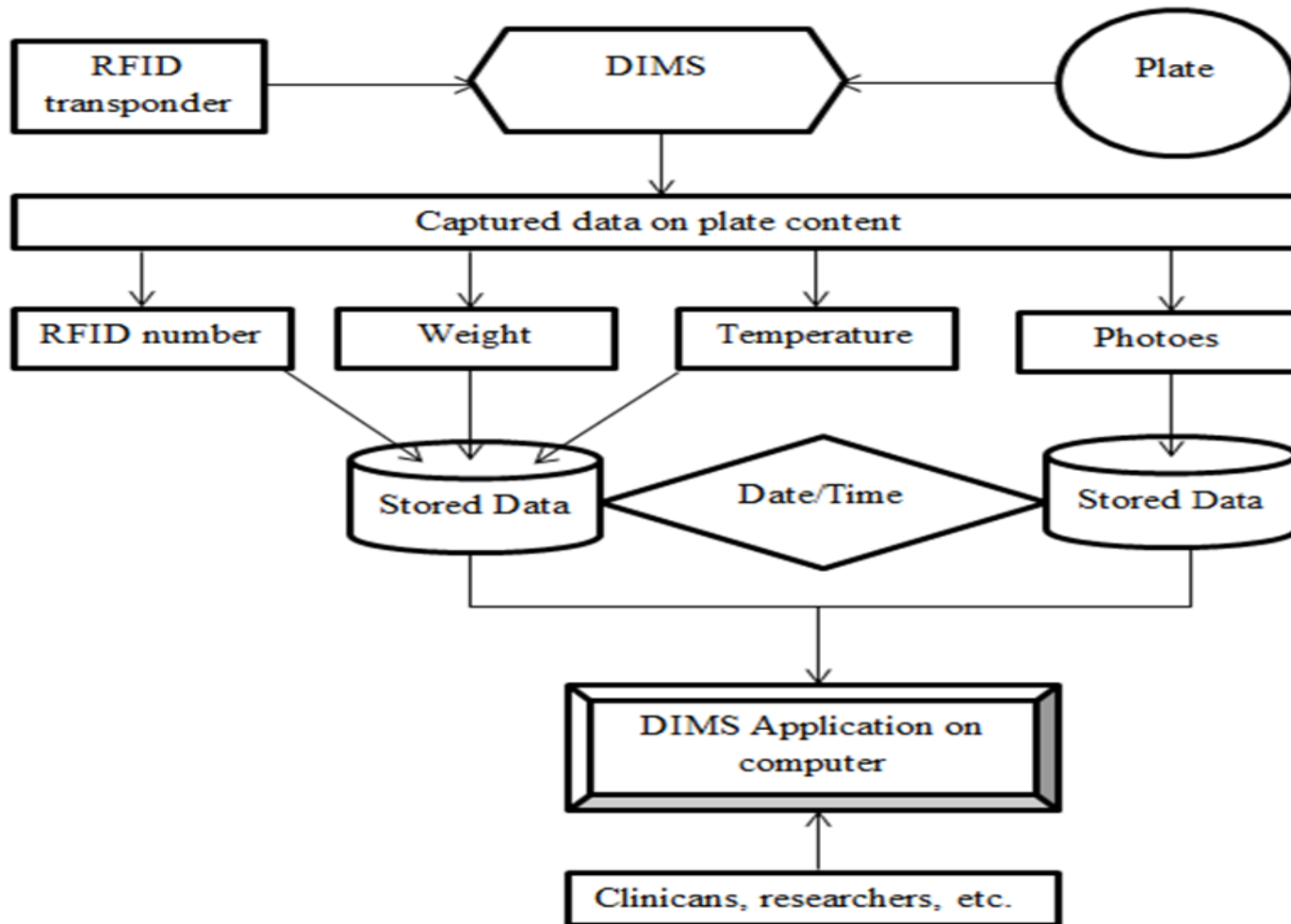
Pilot Test at Aalborg University Hospital

- The DIMS was pilot tested in a medical gastroenterology ward.

- To test the feasibility of measuring food choice, food intake and plate waste

- 23 patients meals served from the Food Trolley
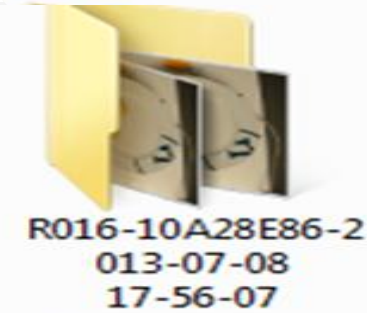
- Collected data at supper meal sessions for 3 days/ on 3 separate occasions

- Approved by the Local Scientific Ethics Committee and all patients gave oral informed consent

Measurement of before and after plate content and weight

R015-50479286-2
013-07-08
17-54-48

R016-10A28E86-2
013-07-08
17-56-07

Patient ID	Weight Before/g	Weight After/g	Food Intake/g	Plate waste/g
50479286	638 -413= (225)	532-413= (119)	106	119 (52.89)
10A28E86	502-413 = (89)	413-413=(0)	89	0

Table 1. Shows food items chosen and served on the study days.

Meal Session	Day 1	Day 2	Day 3
Supper	Gullasch (GH) Mashed potatoes (MB) Parsley with red onion (PO) Potatoes small /spiced (PS)	Manogryde (MG) Fish (FH) Mashed potatoes (MP) Parboiled rice (PR) Hollandaise sauce (HS) Bacon tern (BT) Broccoli salad with pumpkin seeds (BP) Mayonnaise (MY) Butter (BU)	Chili concarne (CC) Mashed potatoes (MB) White sauce (WS) Carrot salad (CS) Fish cakes with herbs (FC) Potato / whole vaccum precooked (PP) Lingonberry jam (LJ) Butter (BU)

Table 2. Shows patient's food choice, plate waste, food intake and the temperature of food before & After consumption.

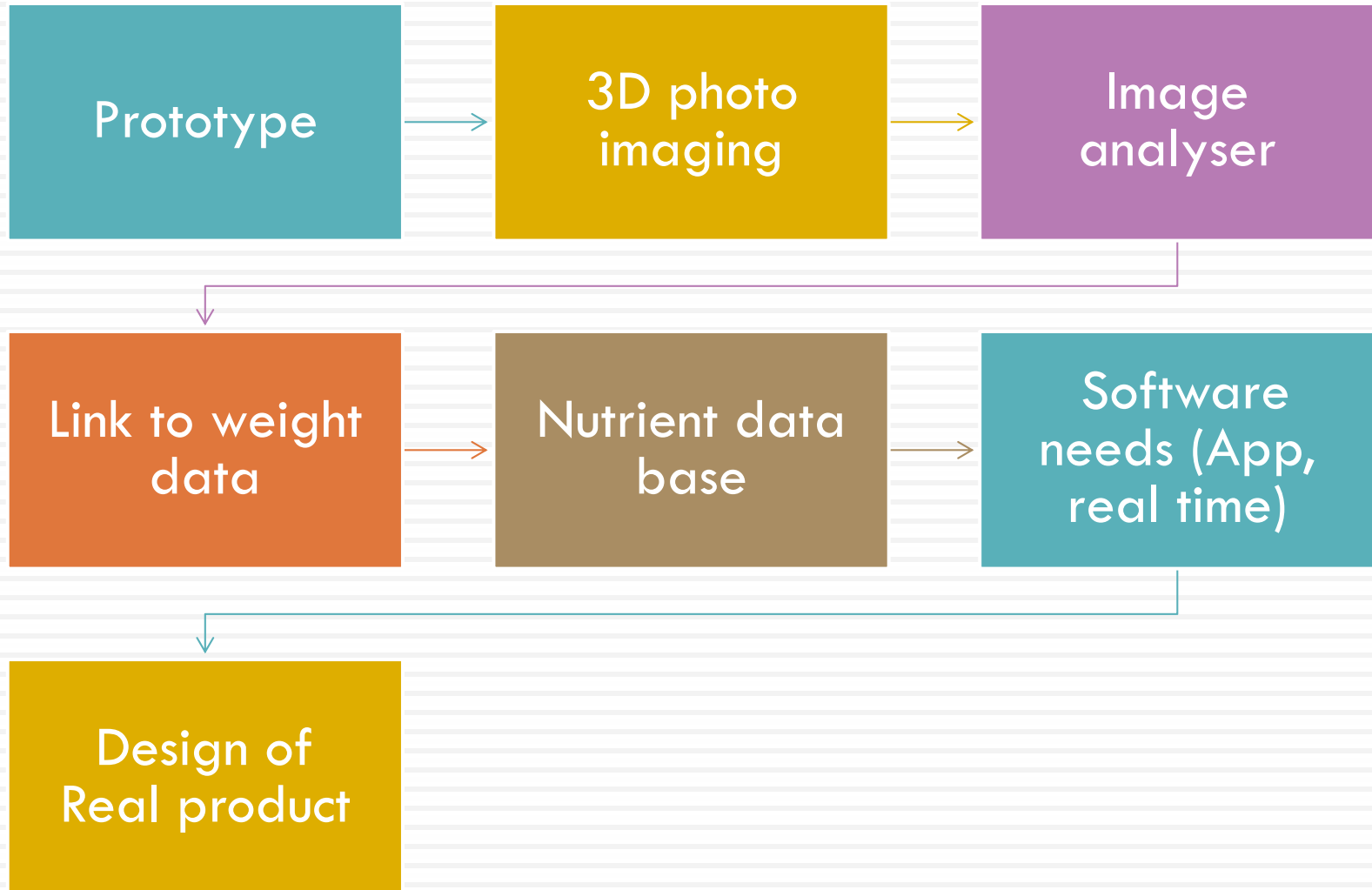| RFID code	Food items on plate before consumption (total food items)	Total food weight before consumption (g)	Temperature of food before consumption (C°)	Food items on plate after consumption (total food items)	Total food weight after consumption (g)	Plate waste (%)	Total food intake (g)	Total food intake (%)
a0789086	GH,MP, PO (3)	441	23,6	GH,MP,PO (3)	122	27,6	319	72,3
10a28e86	GH,MP,PO,AC (4)	358	24,0	(0)	0	0	358	100
90b59286	GH,MP,PO (3)	274	23,2	GH,PO (2)	54	19,7	220	80,3
80509386	GH,PO,PS (3)	379	23,1	PO,PS (2)	91	24,0	288	75,9
c0dc8e86	MG,PR,MY,BT,BP(5)	296	24,0	(0)	23	7,8	273	92,2
602b9086	FH,MP,HS,BT,BP(5)	430	23,3	(0)	0	0	430	100
c0279386	MG, PR,BP,MY(4)	202	23,8	MG,PR,BP,MY(4)	146	72,2	56	27,7
a0b49286	FH, PR,HS (3)	206	23,7	(0)	0	0	206	100
e0399386	FH, MP, HS,BT(4)	265	24,6	(0)	0	0	265	100
40ba9286	MG,PR,BP,BT,MY(5)	256	23,1	MG,PR,BP,BT,MY(5)	208	81,3	48	18,6
20f08f86	FH,MP,BU (3)	272	24,3	FH,MP(2)	157	57,7	115	42,3
a00d9186	FH,RP,HS,BT(4)	178	23,9	FH,RP,HS,BT(4)	160	89,9	18	10,1
e0be9286	MG,MP(2)	112	23,5	(0)	0	0	112	100
60b79286	MP,CC(2)	265	24,5	CC(1)	38	14,3	227	85,7
50319386	FC,MP,WS(3)	193	25,0	WS(1)	30	15,5	163	84,5
c04c9386	FC, MP,WS,CS(4)	270	26,2	(0)	0	0	270	100
d04c9386	FC, MP,WS,LJ(4)	302	25,7	(0)	0	0	302	100
80eb8f86	FC,MP,WS(3)	329	23,8	WS(1)	20	6,1	309	93,9
604e9286	FC, MP,WS,CS(4)	310	26,3	FC, MP,WS,CS(4)	244	78,7	66	21,3
504f9286	FC, MP,WS,CS,LJ(5)	264	24,3	FC, MP,WS,CS,LJ(5)	245	92,8	19	7,2
c0009386	FC,PP,WS,CS(4)	322	24,2	FC,PP,WS,CS(4)	117	36,3	205	63,7
20d98e86	FH,MP,CS,BU(4)	318	24,7	FH,MP,CS,BU(4)	132	41,5	186	58,5
904b9387	FC,MP,WS(3)	267	24,8	(0)	0	0	263	100
Mean	(4)	283	24,2	(2)	78	27,5	205	72,5

Cost estimates: DIMS vrs Current Method

Method	Total of patient	25 % of malnourished patients	Time /patient =	Total time	Total Cost/hr =130kr / 17€
Current method	23	5.8	15mins	5.5X 15 min=87 m	188,7kr /24,8€
DIMS	23	5.8	30secs	5.8X30 sec=3m	6,6kr/0,80€

From Prototype-to Real Product

Prototype → 3D photo imaging → Image analyser → Link to weight data → Nutrient data base → Software needs (App, real time) → Design of Real product

Target Market

Work place, School & Foodservice

Nursing homes

Hospitals

Conclusion

- Easy to use
- Improve the monitoring of nutritional intake in hospitals.
- Provide accurate data and eliminate human error during data entry.
- It requires much fewer healthcare professionals to reach a large number of patients.
- Eliminates the burden on patients having to recall details of previous meals eaten.
- It minimises patients' inconveniences.
- Catering department can monitor menu items served to patients and use the feedback to improve services.

Thank You!!!!!

Research Team

- Prof Bent Mikkelsen, *(MENU research Aalborg University)*

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