Alan Spreckley, Ralf Naßmacher – 19th June 2013

ABB Robotics
How does the food get onto your plate?
A Robotic Menu

Power and productivity
for a better world™

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Introduction
How does the food get onto your plate ?

Source http://regiondo.net/media/tickets_queue/2882/8382/original/shutterstock_90163957.jpg

Cooking equipment
What is new in the kitchen ?

- RacerPack

- PalletPack

- Integrated Vision

- 8kg FlexPicker

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RacerPack

RacerPack: Robot function package for packaging based on Indexed Conveyor Control (ICC)

- **RacerPack**

- Function package based on IRB 360 FlexPicker™

- Designed for high capacity collating, picking and placing of products into trays, cartons or feeding of other machineries
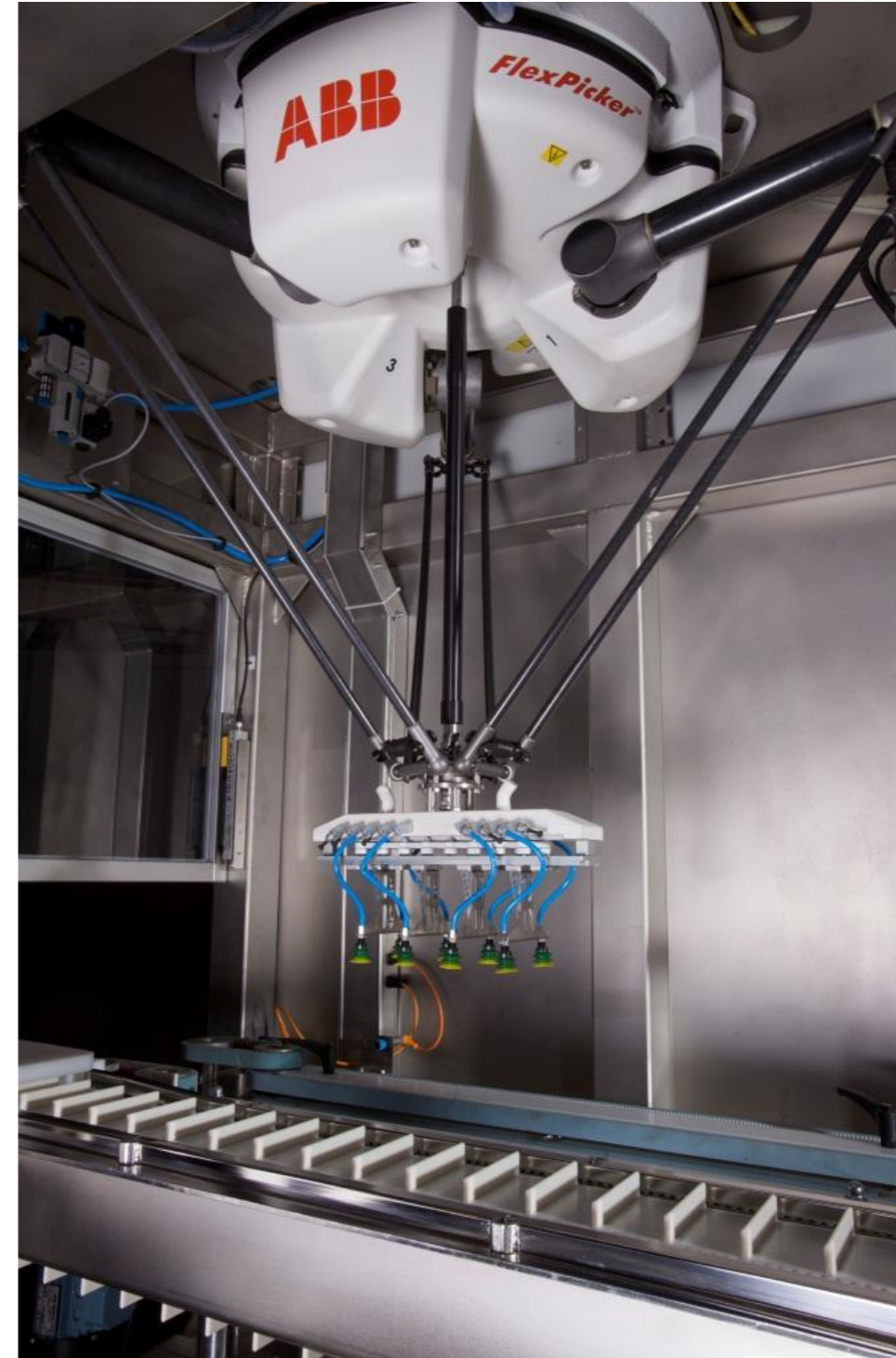
Specification
- Key features: High availability, modular, easy change over, pick and place on moving conveyors
- Industry Segments: Biscuits, Chocolate, Dairy, Meat, Ready Meals
- Product types: Primarily packed products
- Product weight: Typically up to 300g
- Capacity: Up to 400 products/min (pattern dependent)
- Gripper: Vacuum or mechanical gripping

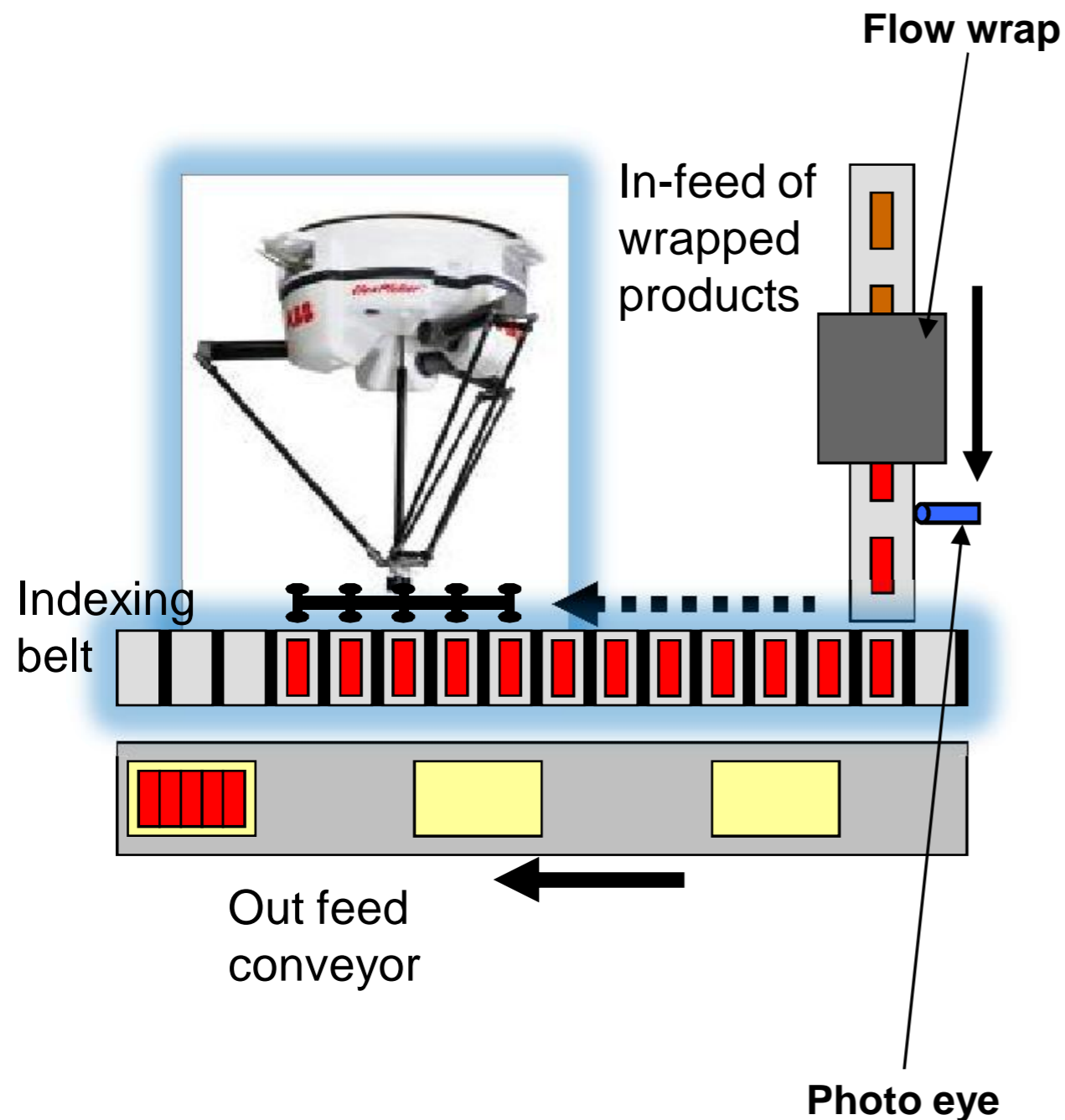# RacerPack: Robot function package for packaging based on ICC

▪Stepping conveyor as external axis

▪Panel Mounted Contoller and PLC AC 500

RacerPack
Principle

Flow wrap

In-feed of wrapped products

Indexing belt

Out feed conveyor

Photo eye

- Integrated control of both robot and indexing conveyor
  - Encoder and encoder board NOT needed for tracking.
  - ABB Motor package
- Output conveyor runs with external drive system
  - Encoder and encoder board needed for tracking (existing conveyor tracking)
- Photo eye on in feed triggers indexing belt movement
  - 300 ms in advance
  - Flow wrapper output is autonomous

Targeted applications
Packing of flow wraps

Combining the ability to follow an indexing conveyor with the 8 kg payload capacity makes the IRB 360 for packing flow wrapped products

- Packing of multiple products

- Pick complete or double layer at a time

- Up to 65 cycles per minute at 8 kg payload for 90-400-90 packing cycle

- Tool flange designed to handle large grippers

- Can pick up to 500 products per minute from an indexing belt (50 mm pitch)

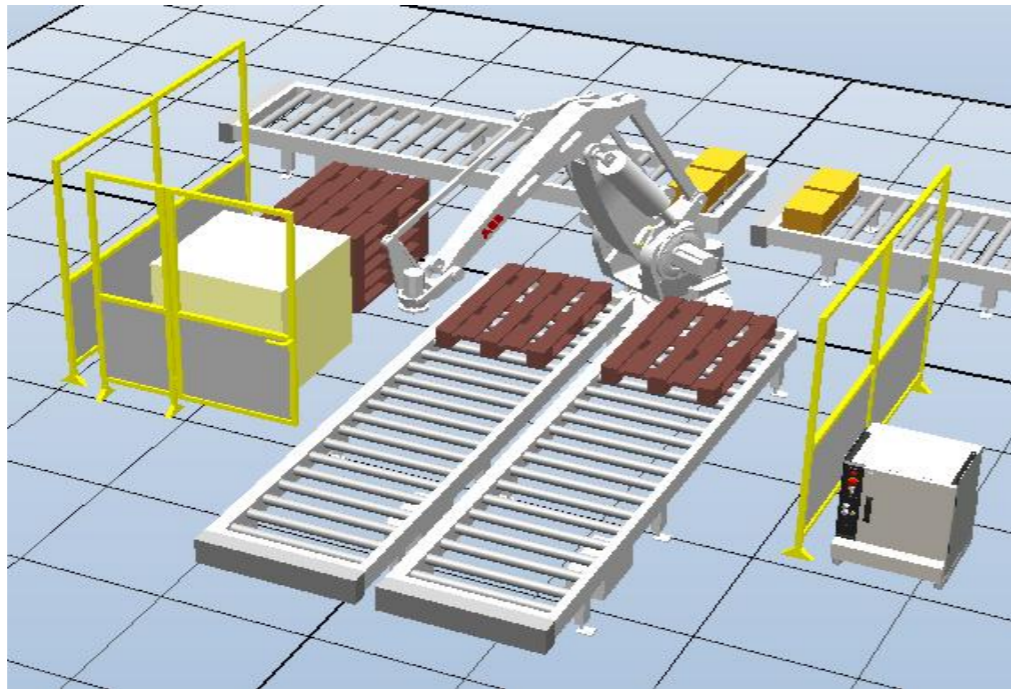Power and productivity
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PalletPack 460

PalletPack 460
Robot function package for palletizing

A modular function package for palletizing.

Based on IRB 460, FlexGripper, safety and PalletWare (ABB software).

Constructed of standard modules and can be assembled in different layouts and with either single or dual infeeds and outfeeds to comply customer requirements.

- Specification

- Key features: PLC as master, No Rapid programming, Easy setup, User friendly, High flexibility, Modular, HMI included

- Segment: All segments

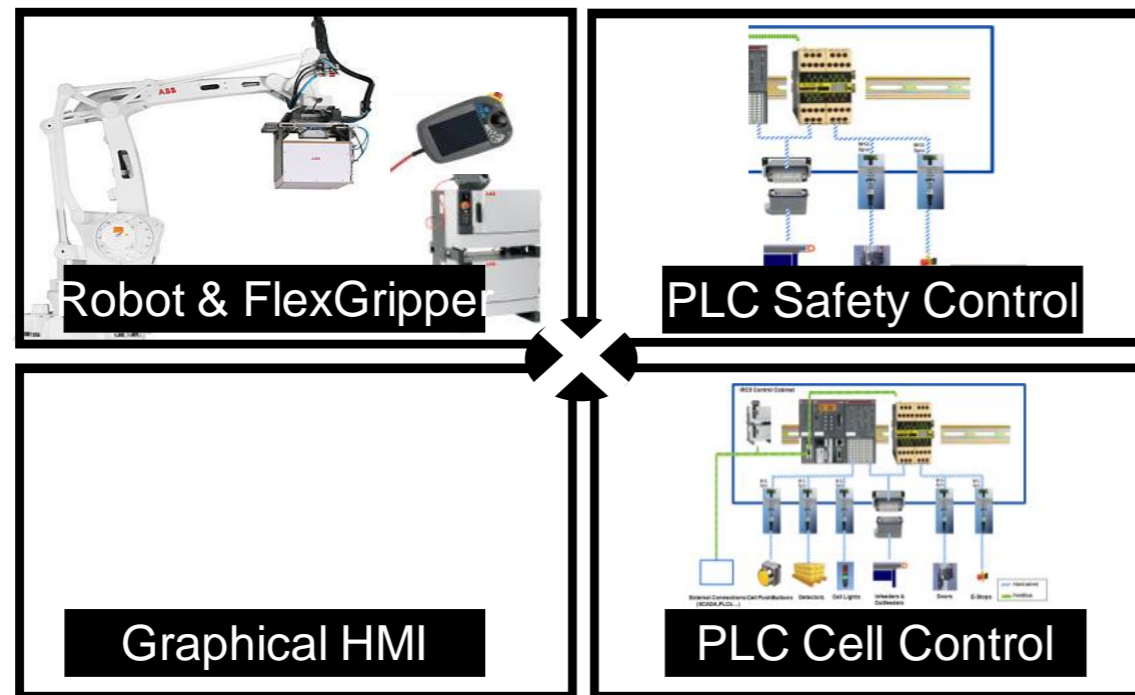- Product types: Bags, Boxes and bundles

- Product weight: Up to 50 kg

- Capacity: Typical 10-20 cycles per min

- Gripper: Claw, Clamp or Vacuum

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PalletPack 460 – Robot function package for palletizing
Scope of supply

Robot & FlexGripper

PLC Safety Control

Graphical HMI

PLC Cell Control

- A complete function package for palletizing up to 2 in-feed lines and 2 out-feed lines including:

  - IRB 460 robot

  - Choice of Flexgripper

    - Claw or clamp

  - PLC safety controller

  - PLC cell controller

  - HMI with application wizard

  - Safety system

  - Documentation

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FlexGrippers

FlexGrippers for PalletPack 460

- Clamp – wide clamping stroke adapts to different carton width – up to 40 kg payload

- Claw – for bag palletizing up to 50 kg payload

PalletPack
Key values

- **reduced engineering**

- **cost saving**

- **easy to integrate**

- **easy to use**

- **lean configuration**

- **lightweight**

- **graphical User Interface (GUI) provided on robot FlexPendant for easy gripper setup, tuning, and production monitoring.**

- **shorter cycle times**

- **improved throughput**

- **improved efficency**

- **cost effective**

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Introduction

There are endless applications in which a Vision Guided Robot can add flexibility, reduce hard automation cost at the same time meeting high quality standards and safety guide lines. The only question is if it can be done in a cost effective and reliable way?

ABB Integrated Vision does not compromise anything. The most advanced vision tools needed are now an integral part of ABB robots and with minimum experience or programming time perform a variety of applications that work 24-7.

U1   Do you have anything other than a cartoon of a factory? We shouldn't use cartoons.
USNISAL; 11.04.2013

U2   I think the two statement's below should go into the talking points.
No one is going to set during a presentation and read them
USNISAL; 11.04.2013

Introduction
ABB Smart Camera

**Compatable to Cognex
In-sight series**

Integrated Lightning

75x55x47 mm

IP 67

4 different lenses

Autofocus optics

**Ethernet, power and I/O
via industrial M12 connectors**

**800x600 or 1280x1024
resolution**

Target applications
Find it, Check it, Trace it

Find it

Check it
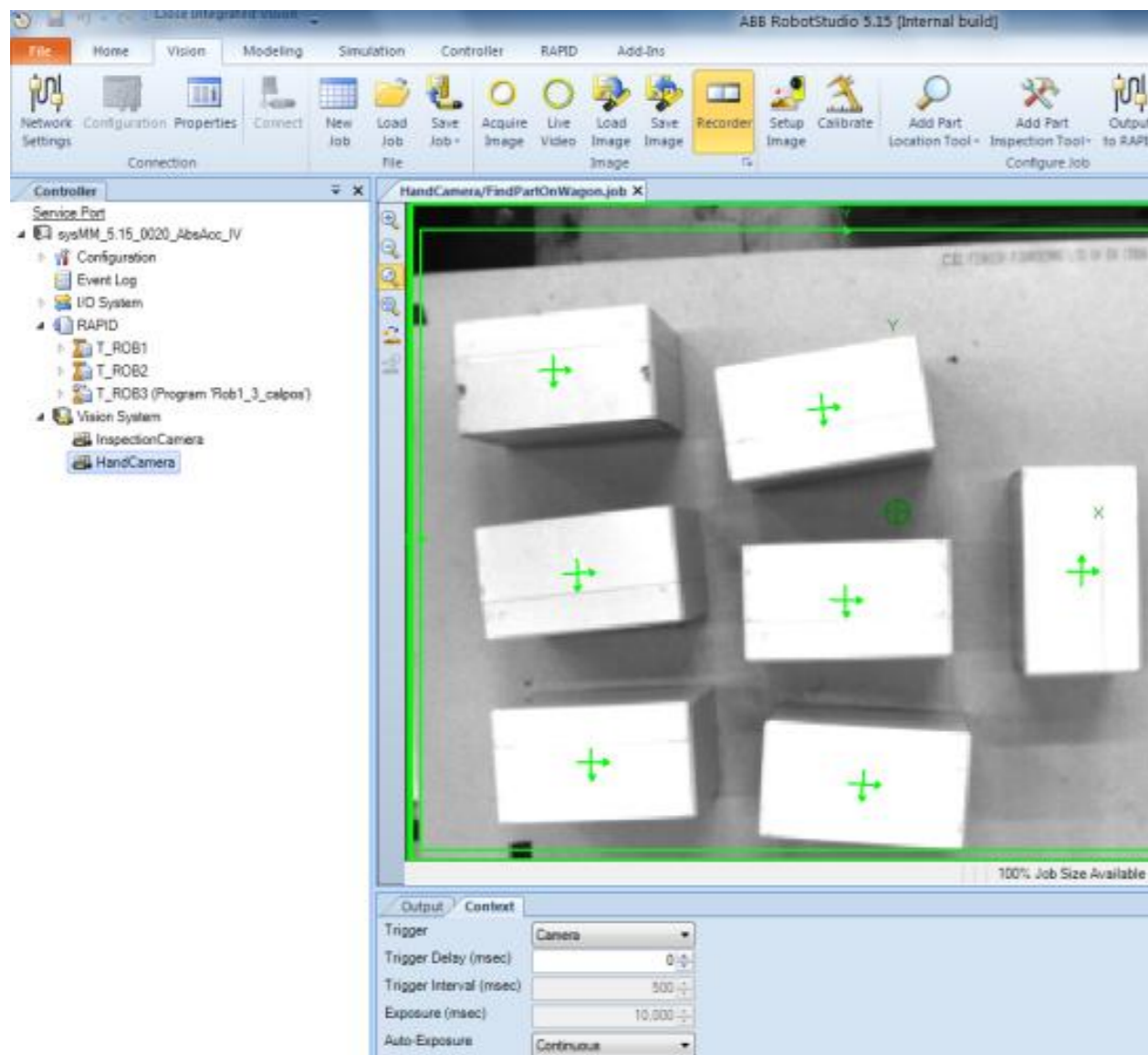
Trace it

780863 185779

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U3 I would prefer to use a real box with a real bar code on it
USNISAL; 11.04.2013

How it works
Programmed in RobotStudio

- both robot and camera are programmed in RobotStudio

- camera an integral part of the system

- easy to understand "How To" programming tabs in RobotStudio

- program sent to controller via Ethernet but is NOT needed in runtime

How it works
> 50 task oriented vision tools

Location Tools

Compute Fixture

Calculates a Fixture location based on mathematical expressions; reports the X,Y coordinates and angle of the mathematically computed Fixture. Outputs a Tool Fixture that can be referenced by o...

Color Blobs (1-10)

Locates up to 10 groups of connected color pixels, called blobs; reports the X,Y coordinates of the centroid of the found blobs. Outputs a Tool Image and Tool Fixture that can be referenced by other to...

Blobs (1-10)

Locates up to 10 groups of dark or light-colored connected pixels, called blobs; reports the X,Y coordinates of the centroid of the found blobs. Commonly used as a Fixture to orient other vision tools...

Add Part Location Tool ▾   Add Part Inspection Tool ▾   Output to RAPID

Configure Job
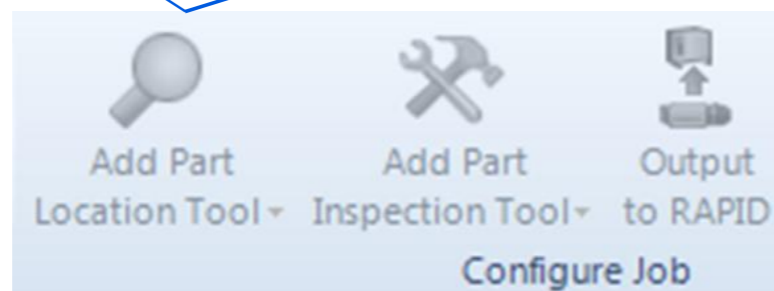
- select from > 50 task oriented vision tools from a list

- comprehensive decription of "How To Use" pop up when a tool is chosen

Key Values
Scalability

- no need for a PC or a special CPU inside robot controller to run the vision cameras

- each camera has its own CPU so there is enough capacity to handle whatever number of cameras - scalable

No need to worry about PC requirements

Key Values
Built in lightning

- the built-in lights

    - provides basic front lightning for standard applications

    - no need to install separate lighting

- allows user to start using the camera without a separate lightning system

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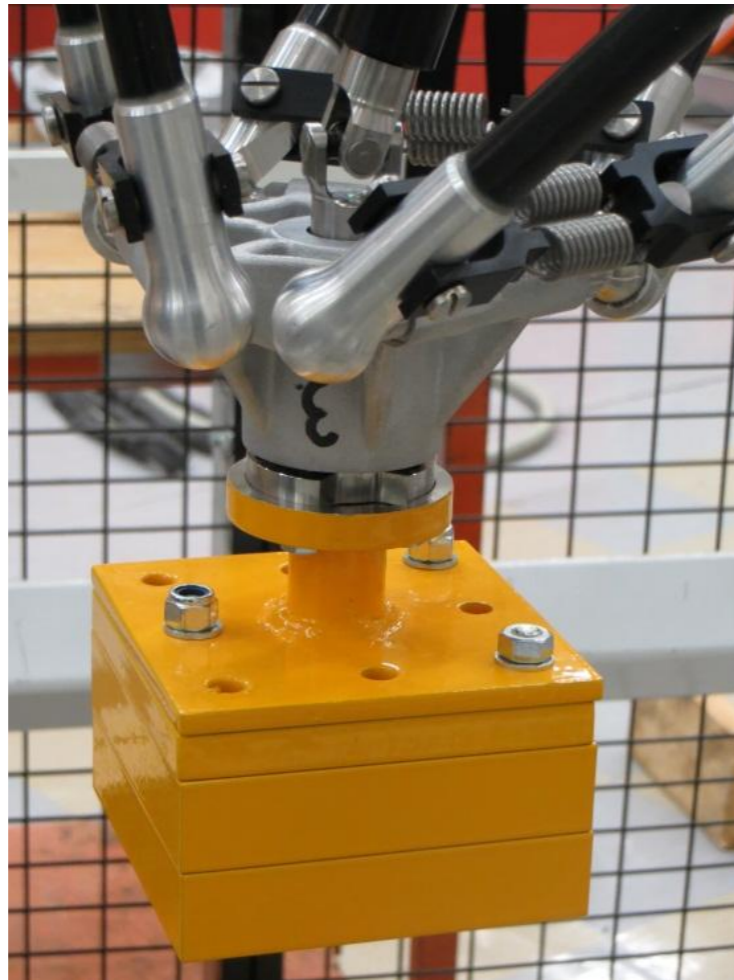# 8kg FlexPicker

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New High Payload IRB 360

What it is
IRB 360-8/1130

- IRB 360-8/1130

  - 4 DOF

  - 8 kg payload

  - 1130 mm working range

  - IP 54

  - Robust tool interface

  - Supported by PickMaster software

IRB 360-8/130 is a new IRB 360 variant that can handle 8 kg managing 60-85 case packing cycles per minute. The robot base is the same as for all other variants but the moving parts have a new more robust design.

The Flexpicker Family
IRB 360

Compactness

Speed

Throughput

Stainless

Reach

8 kg payload

Targeted applications
Higher throughput

The throughput capacity is radically improved by the combined speed and payload performance of IRB 360

Introdution
But how does the food get onto your plate ?

Source http://regiondo.net/media/tickets_queue/2882/8382/original/shutterstock_90163957.jpg
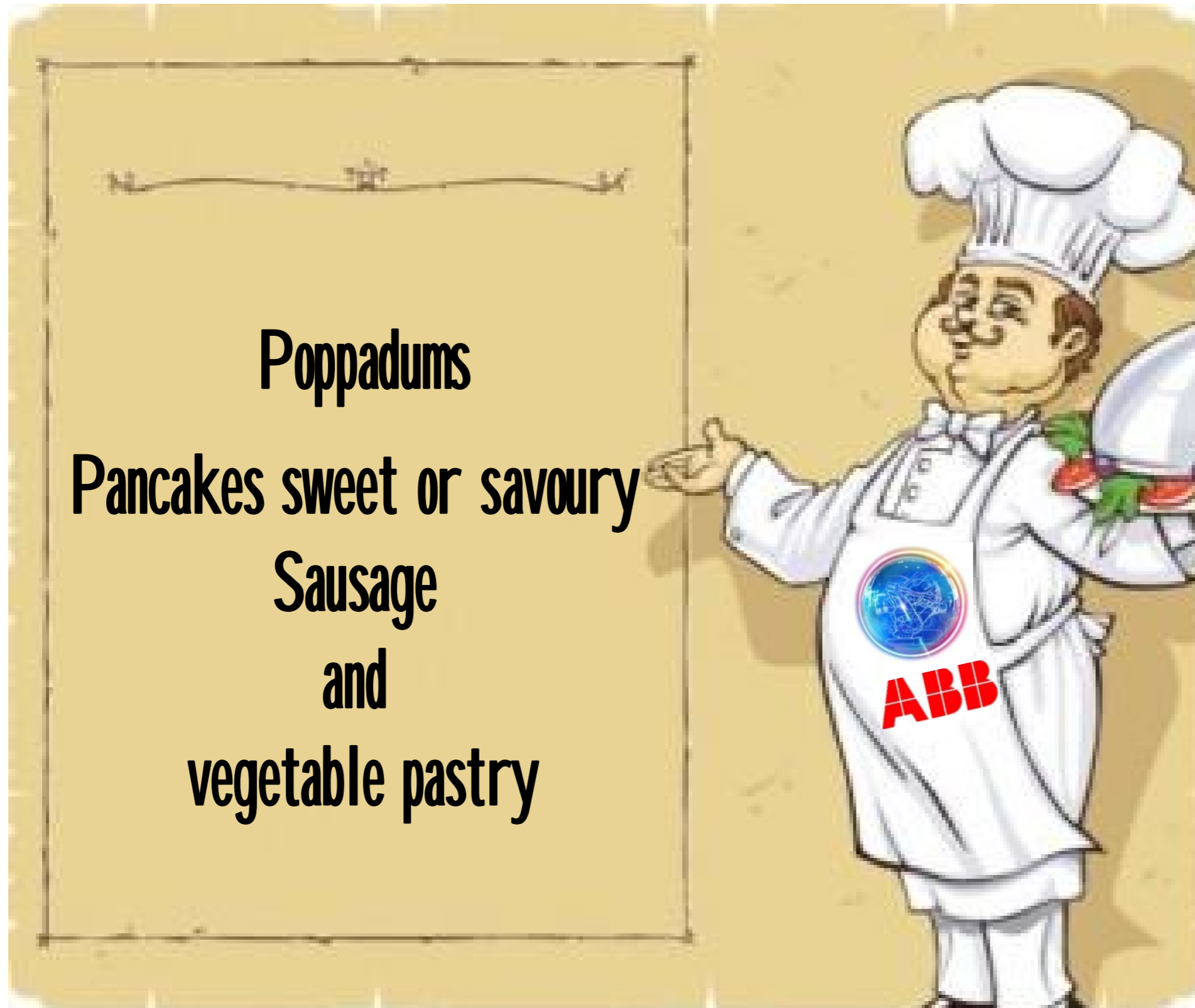
ABB Restaurant
Drinks Menu

Beer

Wine

Vodka

Poppadums

Pancakes sweet or savoury

Sausage

and

vegetable pastry

Meat

Fish

Pizza

ABB Restaurant
hmm

History of selling meat

1950

http://www.metzgerei-fischer-viechtach.de

- tradition
- meat is something special, once a week

2000

http://www.br.de/fernsehen/bayerisches-fernsehen

- customer loyalty
- meat mostly every day

2013

http://www.mz-web.de

- no service
- you are alone with the product

- unpacked
- processed at home

- packed for transport to home
- you can ask for products, recipes

- everything is packed
- information on package

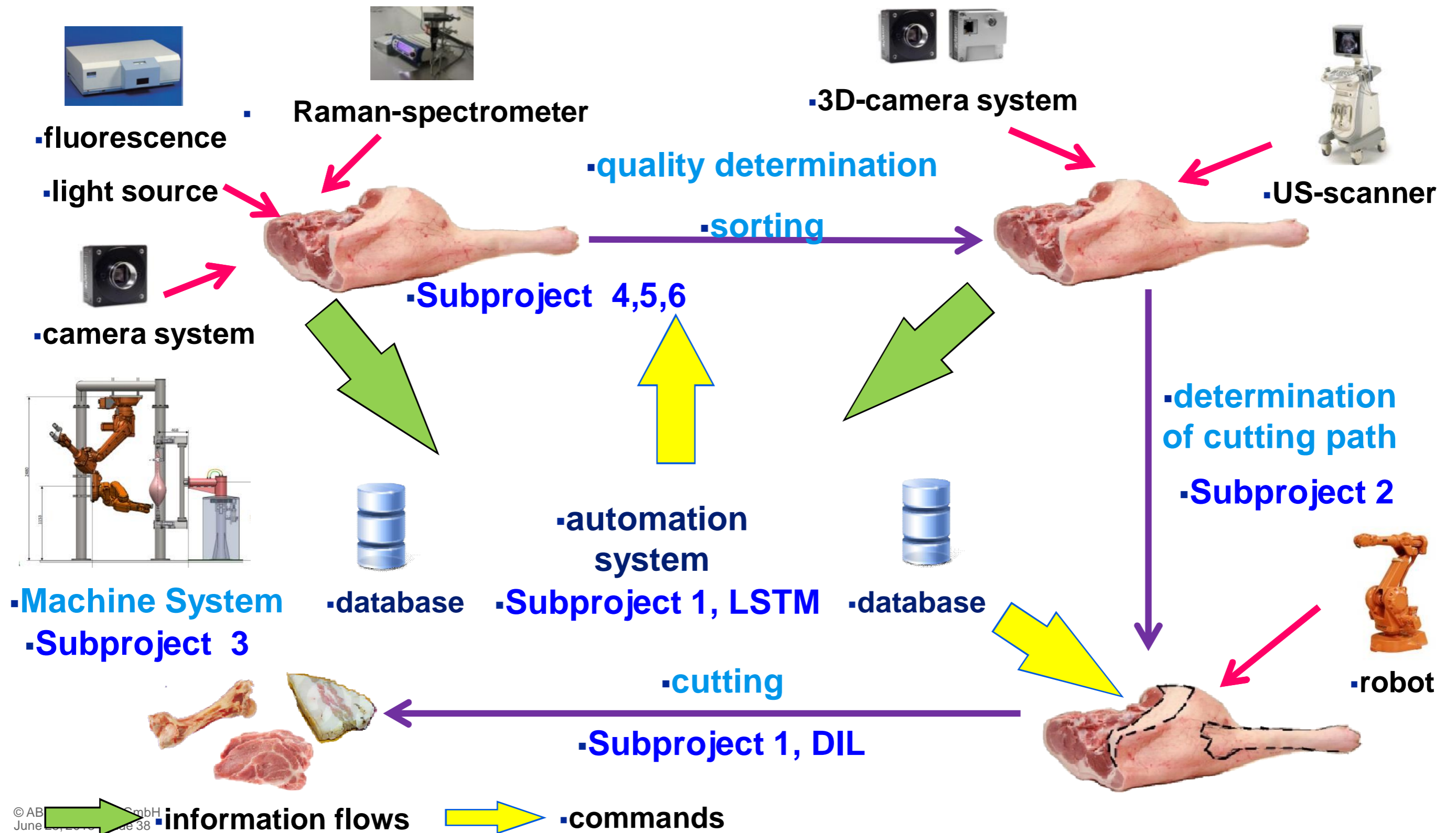# Modern meat production
„look beyond the plate"

a future project

Dr.-Ing. Knut Franke

German Institute of

Food Technology

"Minimal Processing in the automated deboning of pig leg"
Public founded research project (basic + applied)

- fluorescence
- light source

Raman-spectrometer

- camera system

- 3D-camera system

- US-scanner

- quality determination

- sorting

Subproject 4,5,6

- determination of cutting path
- **Subproject 2**

- **Machine System**
- **Subproject 3**

- database

- automation system
Subproject 1, LSTM

- database

- robot

- cutting

Subproject 1, DIL

- information flows
- commands

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Implementation of Automated Deboning

Cleaning station

Stand

robot 2 (IRB 2600)
Raman measurement +
Opening for the cutting
+ holding of parts

robot 1 (IRB 140)
Ultra sound scan
+ cutting

transport unit

Sensor box:
(3D-camera-System,
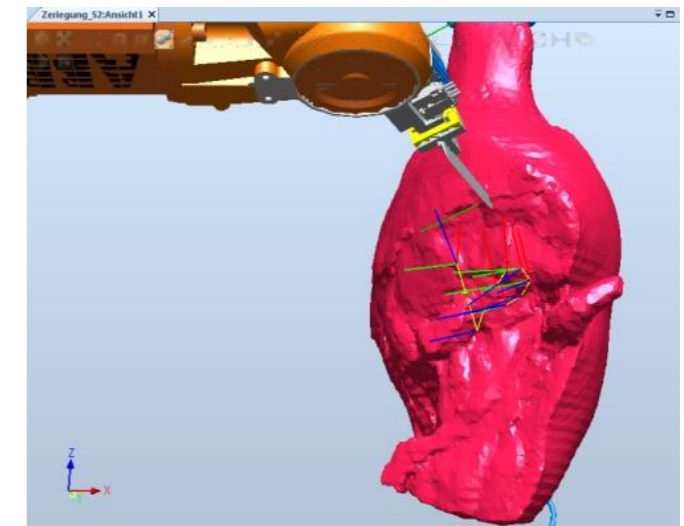fluorescence light
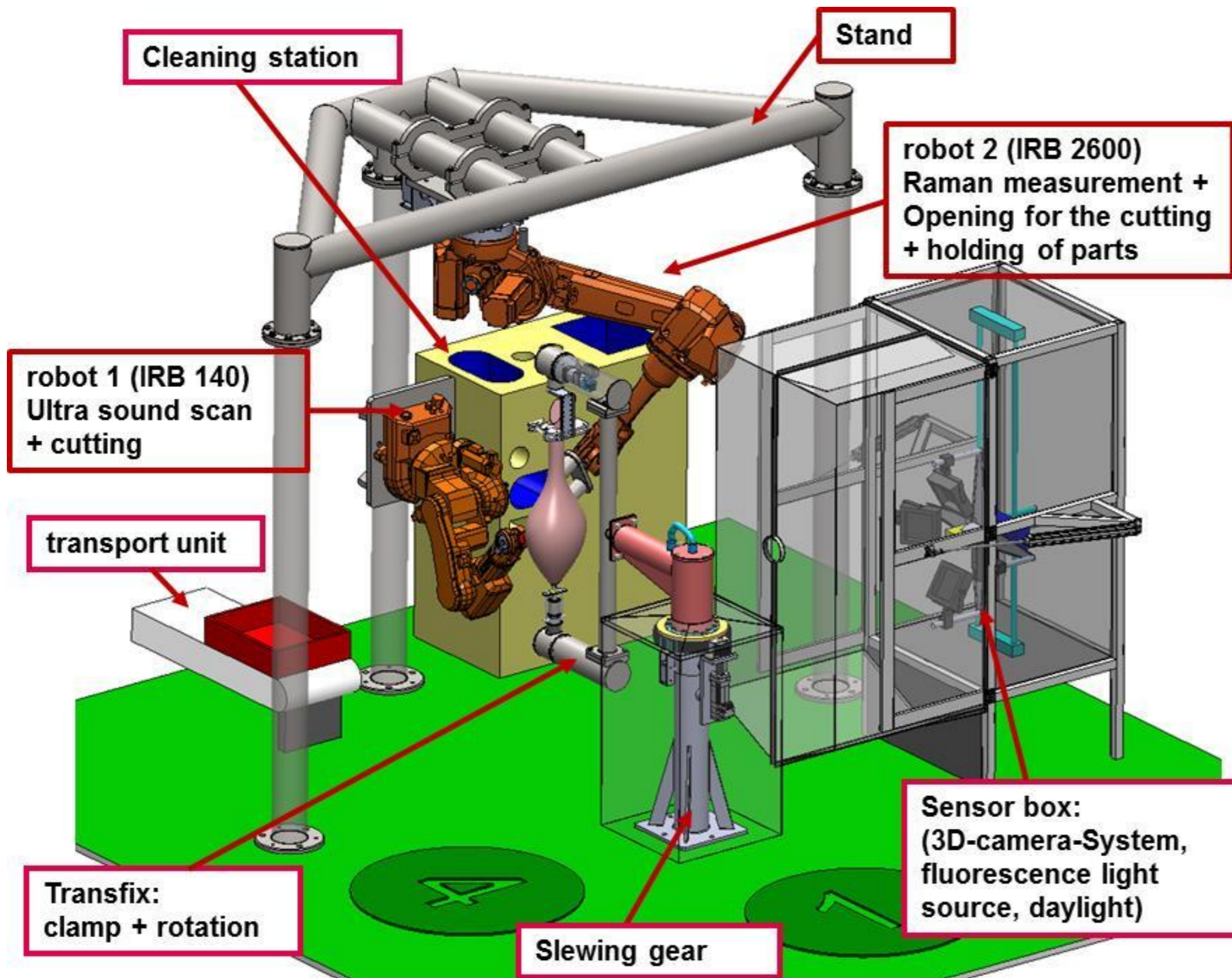source, daylight)

Transfix:
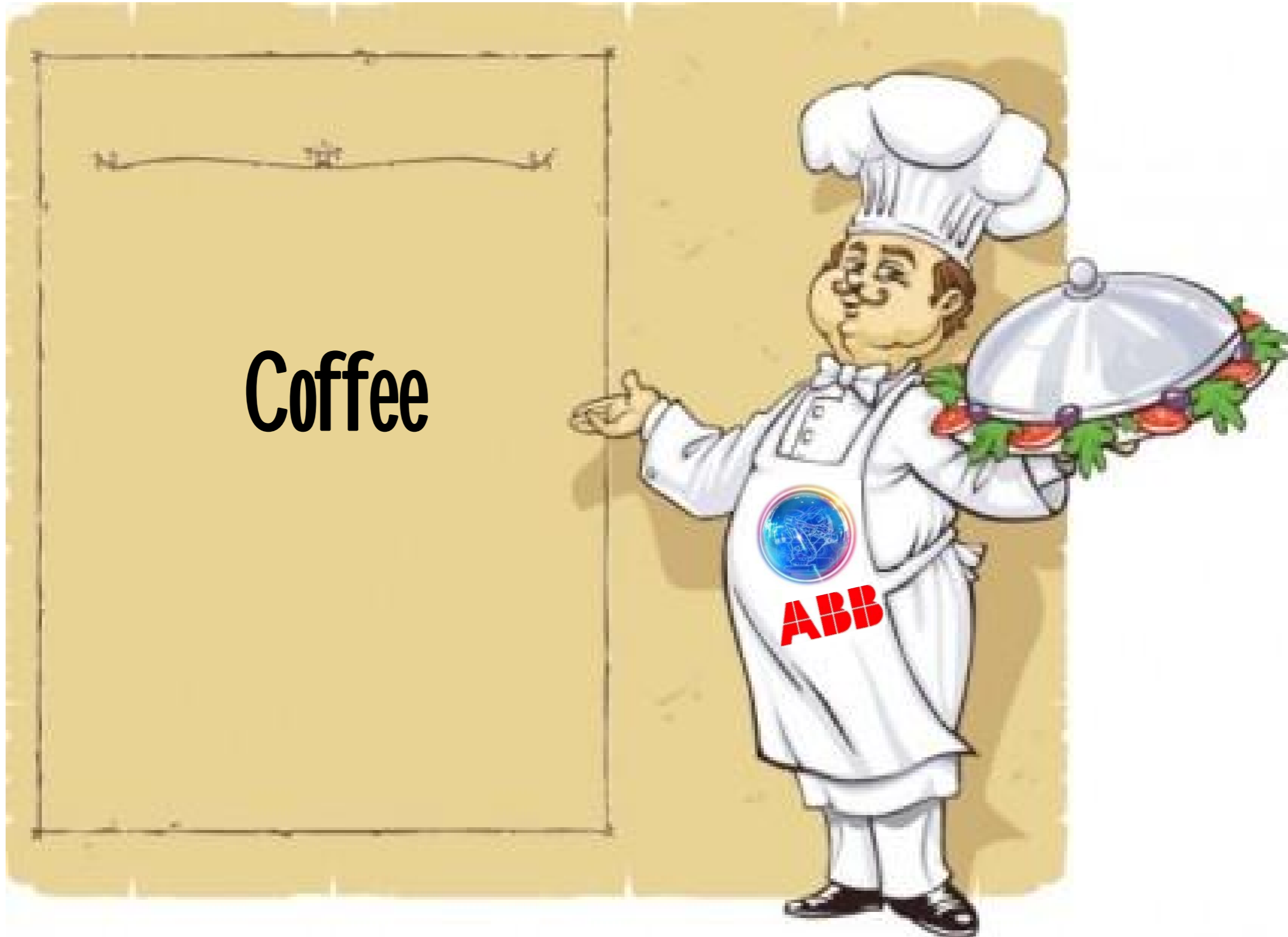clamp + rotation

Slewing gear

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Tartlets'

Cheesecake

Cake with chocolate sauce

ABB Restaurant
Coffee

Coffee

Influences on the market evolution in food production

- every product will be packed

- new emerging markets

- minimum wage implementation

- hygienic environment

- cost pressures in production

- industrial revolution 4.0

- we have to eat every day

Source blog.5pm.co.uk

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ABB Robotic Automation

The final ingredient in many quality meals

Thank you

We invite to join our food market place.

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