

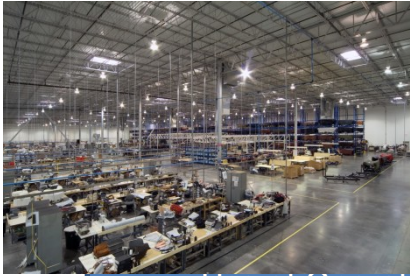
Operation Management (OM) Introduction

Ing.J.Skorkovský, CSc,
Department of Corporate Economy
FACULTY OF ECONOMICS AND ADMINISTRATION
Masaryk University Brno
Czech Republic

Coordinates – již bylo prezentováno

- **Lecturer** : Ing.Jaromír Skorkovský, CSc.
 - Department of Corporate Economy (5th floor)
 - miki@econ.muni.cz
 - +420 731113517
- **Study material** : will be updated regularly (is.muni.cz)
- **Attendance** : seminar and lectures are obligatory – see subject specification (is.muni.cz) – first important condition to be admitted to exam)
- **Excuses** : if serious reason emerges- only written form is accepted
- **Seminar work (pouze MKH-RIOP)** : will assigned after some theory will be presented. Accepted seminar work is the second condition to be admitted to exam)
- **Tuition plan** : at the **end** of this slide show

What is going on ?

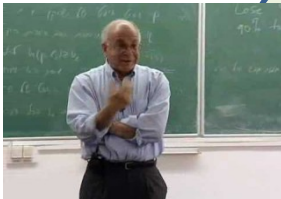
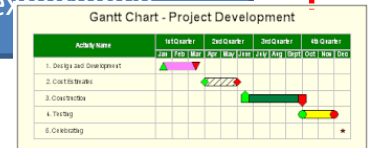


Use of Operations Management (OM) in external environment
(main target)



General knowledge of OM methods acquired at university and long-standing experience

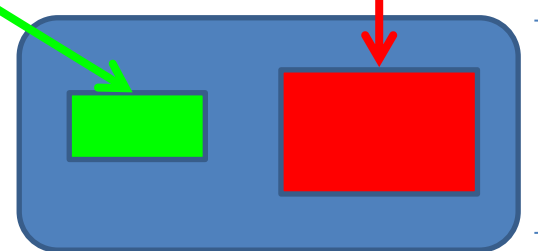
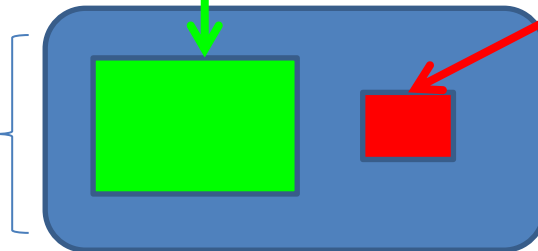
$$= \frac{\sum_{x_1} f_1(x_1) f_2(x_2, x_1)}{\sum_{x_1} f_1(x_1) \sum_{x_2} f_2(x_2, x_1)}$$



Knowledge of methods and experience from research and literature - **teachers**



Knowledge of methods and experience from outside world - **consultants, managers, ...**



Extent of knowledge

Extent of knowledge



Synergy and put OM into practice

OM all around us

OM is the management of all processes used to design, supply, produce, and deliver valuable goods and services to customers



IN

Processing-transformation

Out

TQM = Total Quality Management

ERP: Logistics, Transportation

MRP, JIT, APS, Lean Manufacturing, Little's law

ERP: Marketing, Selling, Invoicing, Payment,....

Some OM methods

- Theory of Constraints
- Balanced Scorecard
- Project Management methods (Critical Chain, SCRUM,...)
- Material Requirement Planning and Just-in-Time
- Advanced Planning and Scheduling
- Six Sigma – quality management
- Boston, SWOT and Magic Quadrant Matrices
- Little ´s Law (relations between WIP, Throughput and Cycle time)
- Linear programming (cutting, blending,..)
- Yield Management
- Kepner-Tregoe (support of decision making)

Some tools

CRONUS International Ltd. - Microsoft Dynamics NAV Classic

File Edit View Tools Window Help

Financial Management

- General Ledger
 - Chart of Accounts
 - Budgets
 - General Journals
 - Analysis & Reporting
 - Intercompany Postings
 - Reports
 - History

Chart of Accounts

No.	Name	Income/Balance	Account Type	Totaling	G... G... G...	Net Change	Balance
6620	Job Sales	Income Statement	Posting				
6695	Total Sales of Jobs	Income Statement	End-Total	6605..6695			
6710	Consulting Fees - Dom.	Income Statement	Posting		S.. N.. S..	-235 592,91	-235 592,91
6810	Fees and Charges Rec. - Dom.	Income Statement	Posting		S.. N.. M..	-961,03	-961,03
6910	Discount Granted	Income Statement	Posting			36 610,08	36 610,08
6950	Sales of Service Contracts	Income Statement	Begin-Total				

MS Dynamics NAV 2009

6110 Sales, Retail - Dom. - General Ledger Entries

Posting Date	Document Type	Document No.	G/L Account No.	Description	Department Code	G... G... G... T... P... P... Amount	Bal. A... Bal. T... Account No.	Entry No.
15.01.12	Credit Memo	104001	6110	Credit Memo 104001	SALES	S.. N.. R.. 246,60 G..		2590
16.01.12	Invoice							2771
17.01.12	Invoice							2617
17.01.12	Credit Memo							2622
18.01.12	Invoice							2762
20.01.12	Credit Memo							2656

103018 The Cannon Group PLC - Posted Sales Invoice

General Invoicing Shipping Foreign Trade BizTalk

No. 103018 Posting Date 18.01.12

Sell-to Customer No. 10000 Document Date 18.01.12

Sell-to Contact No. CT000001 Quote No.

Sell-to Customer Name The Cannon Group PLC Order No. 6005

Sell-to Address 192 Market Square Pre-Assigned No.

Sell-to Address 2 External Document No.

Sell-to Post Code/City B27 4KT Birmingham Salesperson Code PS

Sell-to Contact Mr. Andy Teal Responsibility Center BIRMINGHAM

No. Printed 0

T... No.	Description	Quantity	Unit of M...	Unit Price...	Line Amount E...	Line ...
I... 1964-W	INNSBRUCK Storage Unit/G.Door	10	PCS	292,00	2 920,00	
I... 70011	Glass Door	5	PCS	72,30	361,50	

Invoice Line Functions Print... Navigate Help

Some basic processes controlled by ERP –I.

80103-T 19" M009 Monitor - Items by Location

Options

Show Items in Transit . . .

Show Column Name . . .

No.	Description	BLUE	GREEN	RED	SILVER	WHITE	YELLOW
1908-S	LONDON Swivel Chair, blue	237	57	14	0	0	0
1920-S	ANTWERP Conference Table	31	65	10	0	7	0
1924-W	CHAMONIX Base Storage Unit	1	8	2	0	0	15
1928-S	AMSTERDAM Lamp	149	-19	55	0	0	97
1928-W	ST.MORITZ Storage Unit/Drawers	4	23	-1	0	0	41
1936-S	BERLIN Guest Chair, yellow	46	46	50	0	0	0
1952-W	OSLO Storage Unit/Shelf	9	-1	7	0	0	0
1960-S	ROME Guest Chair, green	145	0	24	0	0	0
1964-S	TOKYO Guest Chair, blue	58	60	29	0	0	0
1964-W	INNSBRUCK Storage Unit/G.Door	14	27	-2	0	0	8
1968-S	MEXICO Swivel Chair, black	233	14	17	0	0	0
1968-W	GRENOBLE Whiteboard, red	10	4	4	0	0	10
1972-S	MUNICH Swivel Chair, yellow	35	-1	-4	0	0	90
1972-W	SAPPORO Whiteboard, black	3	2	5	0	0	0
1976-W	INNSBRUCK Storage Unit/W.Door	3	-2	-3	0	0	3
1980-S	MOSCOW Swivel Chair, red	53	14	21	0	0	0
1984-W	SARAJEVO Whiteboard, blue	3	3	4	0	0	0
1988-S	SEOUL Guest Chair, red	41	83	0	0	0	43
1988-W	CALGARY Whiteboard, yellow	0	8	5	0	0	13
1992-W	ALBERTVILLE Whiteboard, green	6	5	-1	0	0	0
1996-S	ATLANTA Whiteboard, base	44	-1	22	0	0	116
2000-S	SYDNEY Swivel Chair, green	134	17	12	0	0	0
766BC-A	CONTOSO Conference System	0	0	0	0	0	0
766BC-B	CONTOSO Office System	3	0	1	0	0	1
766BC-C	CONTOSO Storage System	2	-1	1	0	0	0
80102-T	17" M780 Monitor	5	0	0	0	0	0
80103-T	19" M009 Monitor	0	0	0	0	0	0

Item Help

Used abbreviations : **EOQ** – Economic Order Quantity; **ROP** – Reorder Point; **MRP** –Material Requirement Planning; **COGS** – Cost of Good Sold

Some basic processes controlled by ERP –II.

CONTRIB - DEFAULT - Acc. Schedule Overview

General | Dimension Filters | Options

Account Schedule Name : CONTRIB Date Filter : 01.01.15..31.12.15
 Column Layout Name : DEFAULT Budget Filter :

Row No.	Description	Net Change Debit	Net Change Credit	Balance at Date Debit	Balance at Date Credit
	Contribution margin analysis				
RM	Raw Materials		13,44	577 719,32	
RC	Direct Cost Applied, Cap.		1 824,00		2 846,80
OVC	Overhead Applied, Cap.		380,00		491,10
R	Sales, Retail - Dom.		2 700,00		1 132 035,33
TC	Total direct costs		1 837,44	574 872,52	
▶ KP	Contribution margin	862,56		1 706 907,85	
AM	Margin	482,56		1 706 416,75	
AM%	Margin in %	68,05			50,78

1 7 31 3 12 Functions Help

Some basic processes controlled by ERP –III.

1000 Bicycle - Production BOM

General

No. 1000 Search Name BICYCLE

Description Bicycle Version Nos.

Unit of Measure Code . . . PCS Active Version.

Status Certified Last Date Modified . . . 11.12.10

Type	No.	Description	Quantity ...	Unit of Measu...	Scrap...	Routing Li...
Item	1100	Front Wheel	1	PCS	0	
Item	1200	Back Wheel	1	PCS	0	
Item	1300	Chain Assy	1	PCS	0	
Item	1400	Mudguard front	1	PCS	0	
Item	1450	Mudguard back	1	PCS	0	
Item	1500	Lamp	1	PCS	0	
Item	1600	Bell	1	PCS	0	
Item	1700	Brake	1	PCS	0	
Item	1800	Handlebars	1	PCS	0	
Item	1850	Saddle	1	PCS	0	
Item	1900	Frame	1	PCS	0	

Prod. BOM Component Functions Help

BOM=Bill Of Material->Kusovník

Some basic processes controlled by ERP –IV.

OP100016 Assembling furniture - Opportunity Card

General

No. OP100016 Campaign No.

Description Assembling furniture Priority Normal

Contact No. CT000002 Sales Cycle Code EX-SMALL

Contact Name. Selangorian Ltd. Status Won

Contact Company Name. Selangorian Ltd. Closed

Salesperson Code. PS Creation Date. 04.01.12

Sales Document Type Date Closed. 21.01.12

Sales Document No.

Active	Action Taken	Sales Cycle Stage	Date of Change	Estimated Close Date	Estimated Value (LCY)	Calcd. Current Value (LCY)	Completed %	Chances of Success %	Probability %
<input checked="" type="checkbox"/>	Won	0	21.01.12	21.01.12	5 500,00	5 500,00	100	100	100
<input type="checkbox"/>	Next	4	17.01.12	21.01.12	5 500,00	5 087,50	95	90	93
<input type="checkbox"/>	Next	3	12.01.12	21.01.12	5 500,00	3 987,50	80	65	73
<input type="checkbox"/>	Next	2	08.01.12	21.01.12	5 500,00	2 337,50	50	35	43
<input type="checkbox"/>		1	06.01.12	21.01.12	5 000,00	550,00	2	20	11
<input type="checkbox"/>									
<input type="checkbox"/>									
<input type="checkbox"/>									
<input type="checkbox"/>									
<input type="checkbox"/>									
<input type="checkbox"/>									

Opportunity Functions Create Oppo... Help

Used abbreviations : CRM – Customer Relationship Management

Some basic processes controlled by ERP –V.

2009 Deerfield Graphics Company - Sales Order

General Invoicing Shipping Foreign Trade E-Commerce Prepayment

No. 2009

Sell-to Customer No. 40000

Sell-to Contact No. CT000004

Sell-to Customer Name Deerfield Graphics Company

Sell-to Address 10 Deerfield Road

Sell-to Address 2

Sell-to Post Code/City GL1 9HM Gloucester

Sell-to Contact Mr. Kevin Wright

No. of Archived Versions.

Posting Date 18.01.12

Order Date 18.01.12

Document Date 18.01.12

Requested Delivery Date

Promised Delivery Date .

Quote No.

External Document No. .

Salesperson Code PS

Campaign No.

Opportunity No.

Responsibility Center . .

Assigned User ID

Status Released

Type	No.	Description	Location Code	Reserved Quantity	Unit of Measu...	S... Unit Price	Line Amount	Line	Appl.-to
				Quantity		P... Excl. VAT	Excl. VAT	Disco...	Item Entry
▶ Item	LS-10PC	Loudspeakers, White for PC	WHITE	12	BOX	59,00	708,00		
Item	LS-150	Loudspeaker, Cherry, 150W	WHITE	8	PCS	129,00	1 032,00		

Customer Information

Sell-to Customer

- Ship-to Addresses (0)
- Contacts (1)
- Sales History

Bill-to Customer

- Avail. Credit 0

Item Information

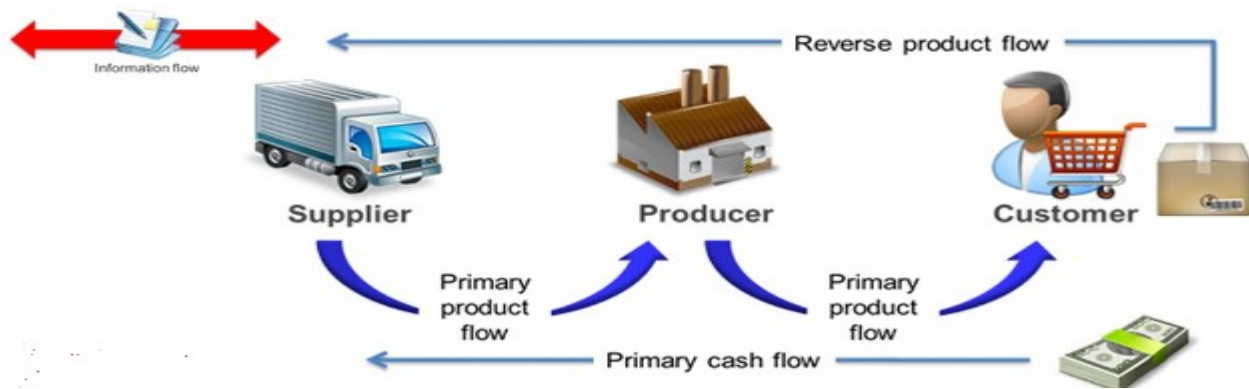
- Item Card
- Availability (-46)
- Substitutions (0)
- Sales Prices (0)
- Sales Line Di... (0)

Order Line Functions Posting Print Help

Used abbreviations : ATP|CTP– Available to Promise | Capable to Promise, Sales Order->Prodejní objednávka

Controlling processes in Supply Chain Management (SCM)

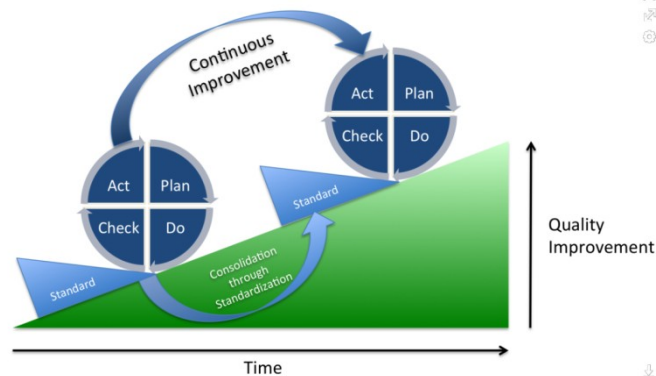
		Supply	Production	Orders (Demands)	
Planning levels {	Strategic	← Operation Strategies and Innovations , R&D →			Demand Planning
	Tactical	Forecasts, Blank Orders	Long term planning	Marketing	
	Operational	Logistic operations	Routing control, TQM	Packaging , Transportation	
	Operational	MRP, Replenishment	MRP_II ; JIT, Capacities	Cash flow	



Used abbreviations : R&D –Research and Development; TQM-Total Quality Management; JIT- Just –In-Time; MRP_II-Manufacturing and Resource Planning

Used abbreviations (slide number 3) : ERP - Enterprise Resource Planning ; APS – Advanced Planning and Scheduling

Deming cycle (PDCA) (based on periodicity)



Plan: Define the problem to be addressed, collect relevant data, and ascertain the **problem's root cause** (e.g. by use of TOC=Theory of Constraints)

Do: Develop and implement a solution; decide upon a measurement to gauge its effectiveness

Check: Confirm the results through before-and-after data comparison.

Act: Document the results, inform others about process changes, and make recommendations for the problem to be addressed in the next PDCA cycle.

Simple example of Deming cycle **(home study)**

Plan: Excessively high value of the stock, which is one of the reasons of low liquidity of our company (converting assets to cash)= **problem's root cause** detected by use of TOC=Theory of Constraints and Current Reality Tree (will be presented later)

Do: Implement algorithm controlling stock replenishment based on MRP principle and ROP and **Safety Stock** level setup. Metrix for effectiveness will be **Inventory Dollar Days (IDD)** - which is one of TOC metrics (will be mentioned during the course)

Check: ERP inventory costing routines before and after implementation of stage **Do** application

Act: Document the results, inform others about process changes, and recommend how to continue in inventory management routines (e.g. use of EAN readers or calculation of **inventory service level** in order to speed up inventory procedures such as put-away and pick or optimize inventory level differently) in the next PDCA cycle.

Used abbreviations : **MRP** – Material Requirement Planning – will be presented; **ROP** – Reorder Point –see next slide); **ERP**- see slide number 12

IDD definition : <https://elischragenheim.com/2016/05/23/throughput-dollar-days-tdd-and-inventory-dollar-days-idd-the-value-and-limitations/>

Explanation of some terms used in PDCA Deming Cycle simple example (**home study**) I.

- **Service level** : represents the expected probability of not hitting a **stock-out**. This percentage is required to compute the safety stock.

Intuitively, the service level represents a trade-off (compromise) between the cost of inventory and the cost of stock-outs (which incur missed sales, lost opportunities and client frustration among others).

$$p = \Phi \left(\sqrt{2 \ln \left(\frac{1}{\sqrt{2\pi}} \frac{M}{H} \right)} \right)$$

M - stock-out cost (often 3 time the gross margin)

H - carrying cost per unit for the duration of the lead time

1litr milk pack -> 1.50€ selling price, 10% margin -> =0,15 €. Lead time = 4 days.

The annual carrying cost is 1.50 € (the value is high because milk is a highly perishable product).

Stock-out cost ->3 time the gross margin, that is to say->M= 0.45€= 3*0,15 €

H=(4/365)x 1.5≈0.0055 -> H≈0.0055 . So p=98,5%

Resource: <https://www.lokad.com/service-level-definition-and-formula>

Lead time = Průběžný čas (bude mnohokrát v kurzu použito)

Explanation of some terms used in PDCA Deming Cycle simple example (home study) II.

The screenshot shows the SAP Item Card for '1952-W OSLO Storage Unit/Shelf' in the 'Planning' tab. The 'Reorder Point' field is highlighted with a red box and contains the value 30. Other fields include Reordering Policy (Fixed Reorder...), Reserve (Optional), Order Tracking Policy (None), Stockkeeping Unit Exists (unchecked), Critical (unchecked), Reorder Cycle, Safety Lead Time, Safety Stock Quantity (10), Reorder Quantity (20), Maximum Inventory (0), Minimum Order Quantity (5), Maximum Order Quantity (0), and Order Multiple (0).

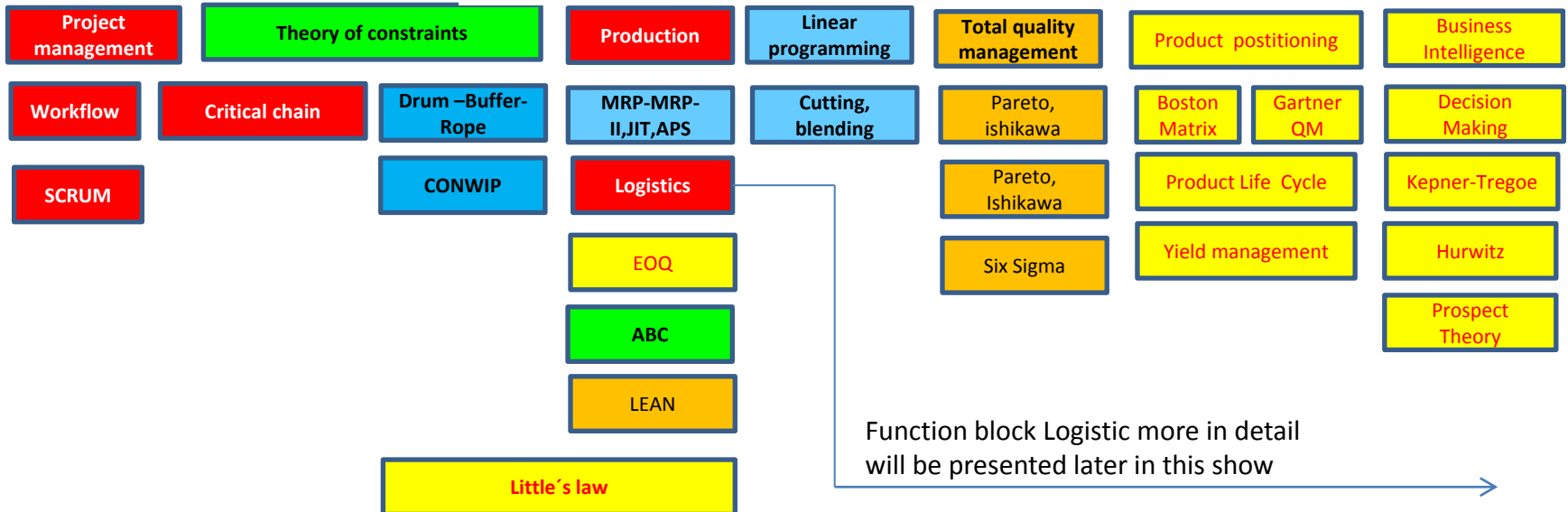
Field	Value
Reordering Policy	Fixed Reorder...
Include Inventory	<input checked="" type="checkbox"/>
Reserve	Optional
Order Tracking Policy	None
Stockkeeping Unit Exists	<input type="checkbox"/>
Critical	<input type="checkbox"/>
Reorder Cycle	
Safety Lead Time	
Safety Stock Quantity	10
Reorder Point	30
Reorder Quantity	20
Maximum Inventory	0
Minimum Order Quantity	5
Maximum Order Quantity	0
Order Multiple	0

Used abbreviations : EOQ – Economic Order Quantity – will be explained during this course in ERP section

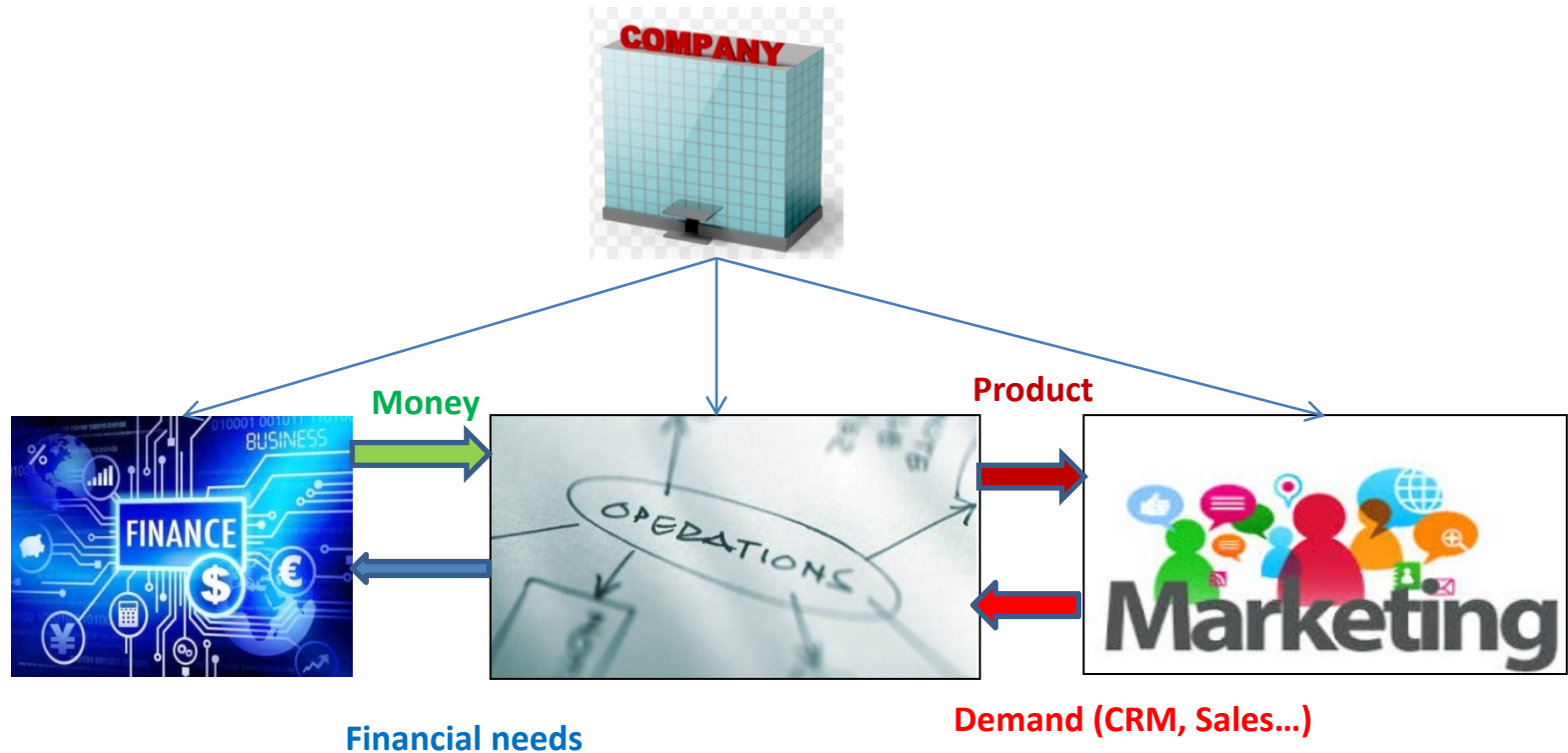
Another point of view I.



This will be modified in following **South African** project show (example of Balanced Score Card use)

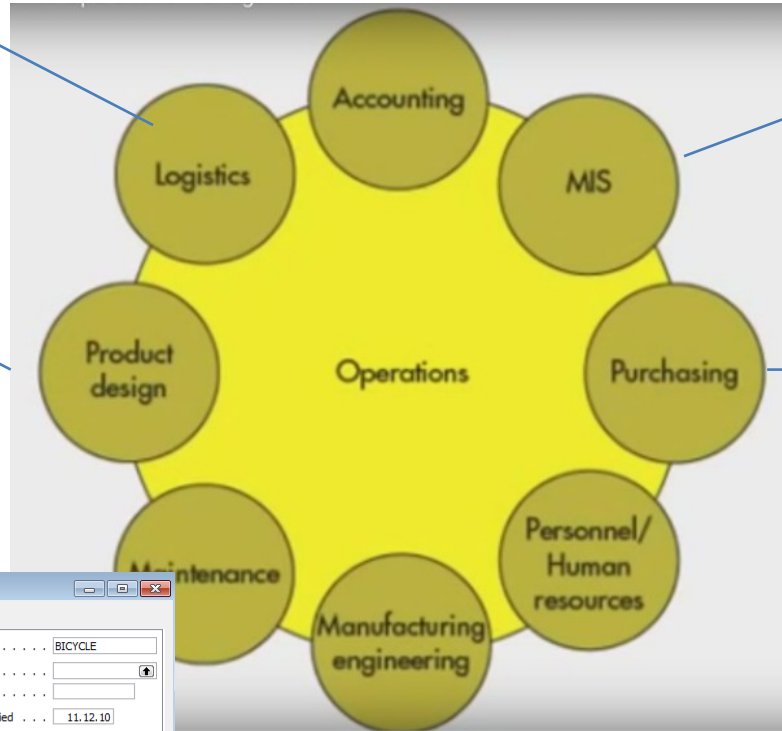


Another point of view II.



Operations

See next slide



Microsoft Dynamics NAV 2009 R2
 Version W1 6.0 R2 (6.00.32012)
 Copyright (C) 2010 Microsoft. All rights reserved.
 This product is licensed to:
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 NAVERTICA a.s.
 Sumavska 15

Brno 602 00
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Manufacturing

- Product Design
 - Items
 - Production BOM
 - Routings
 - Families
 - Exchange Production BOM Item
 - Delete Expired Components
 - Calculate Low-Level Code
- Reports
- Capacities
- Planning
- Execution
- Costing

Purchase

- Planning
 - Items
 - Vendors
 - Requisition Worksheets
 - Recurring Req. Worksheet
 - Order Planning
 - Production Forecasts
 - Purchase Orders
 - Sales Orders
 - Blanket Sales Orders
 - Planned Production Orders
 - Firm Planned Prod. Orders
 - Transfer Orders
- Reports
- Documents
- Setup
- Order Processing
- Inventory & Costing
- Analysis & Reporting
- History
- Setup

1000 Bicycle - Production BOM

General

No. 1000 Search Name BICYCLE

Description Bicycle Version No.

Unit of Measure Code PCS Active Version

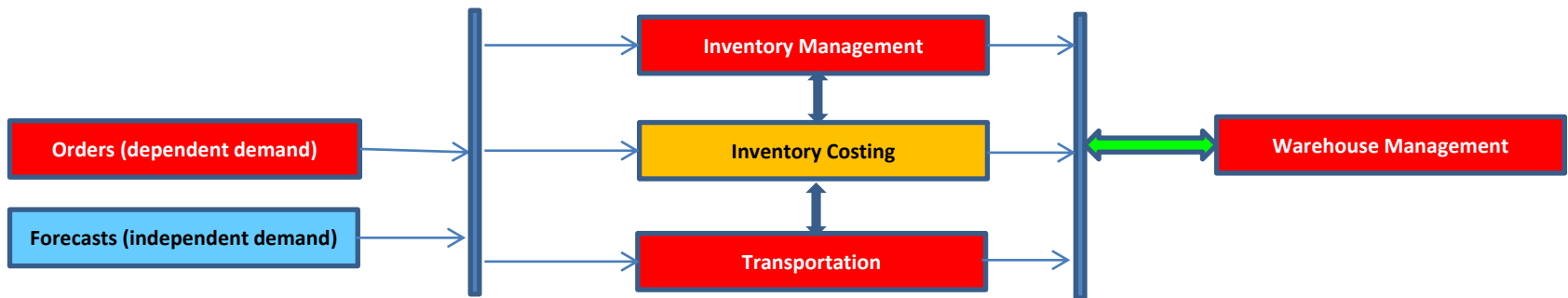
Status Certified Last Date Modified 11.12.10

Type	No.	Description	Quantity	Unit of Measu...	Scrap...	Routing Li...
Item	1000	Front Wheel	1	PCS	0	
Item	1200	Back Wheel	1	PCS	0	
Item	1300	Chain Assy	1	PCS	0	
Item	1400	Mudguard front	1	PCS	0	
Item	1450	Mudguard back	1	PCS	0	
Item	1500	Lamp	1	PCS	0	
Item	1600	Bell	1	PCS	0	
Item	1700	Brake	1	PCS	0	
Item	1800	Handlebars	1	PCS	0	
Item	1850	Saddle	1	PCS	0	
Item	1900	Frame	1	PCS	0	

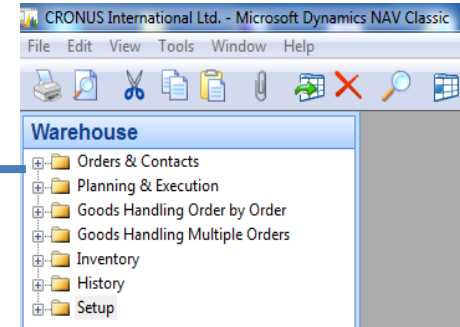
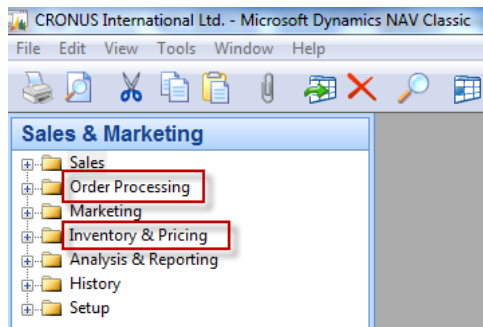
Prod. BOM Component Functions Help

Bill of material

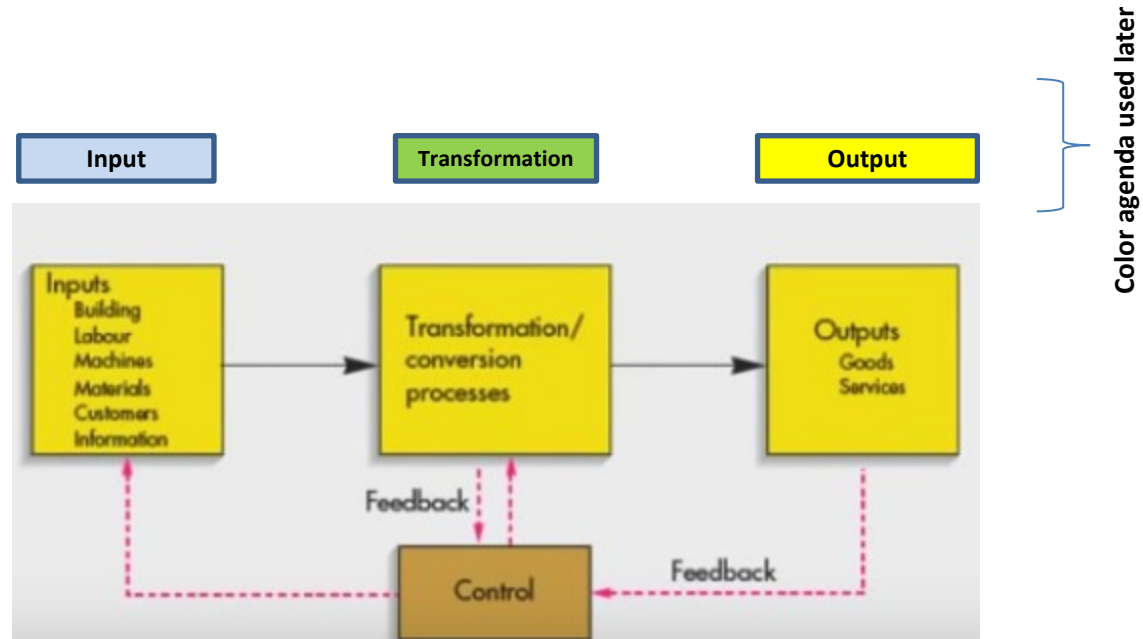
Function block Logistic-simplified



Will be part of our course regarding ERP system MS Dynamics NAV

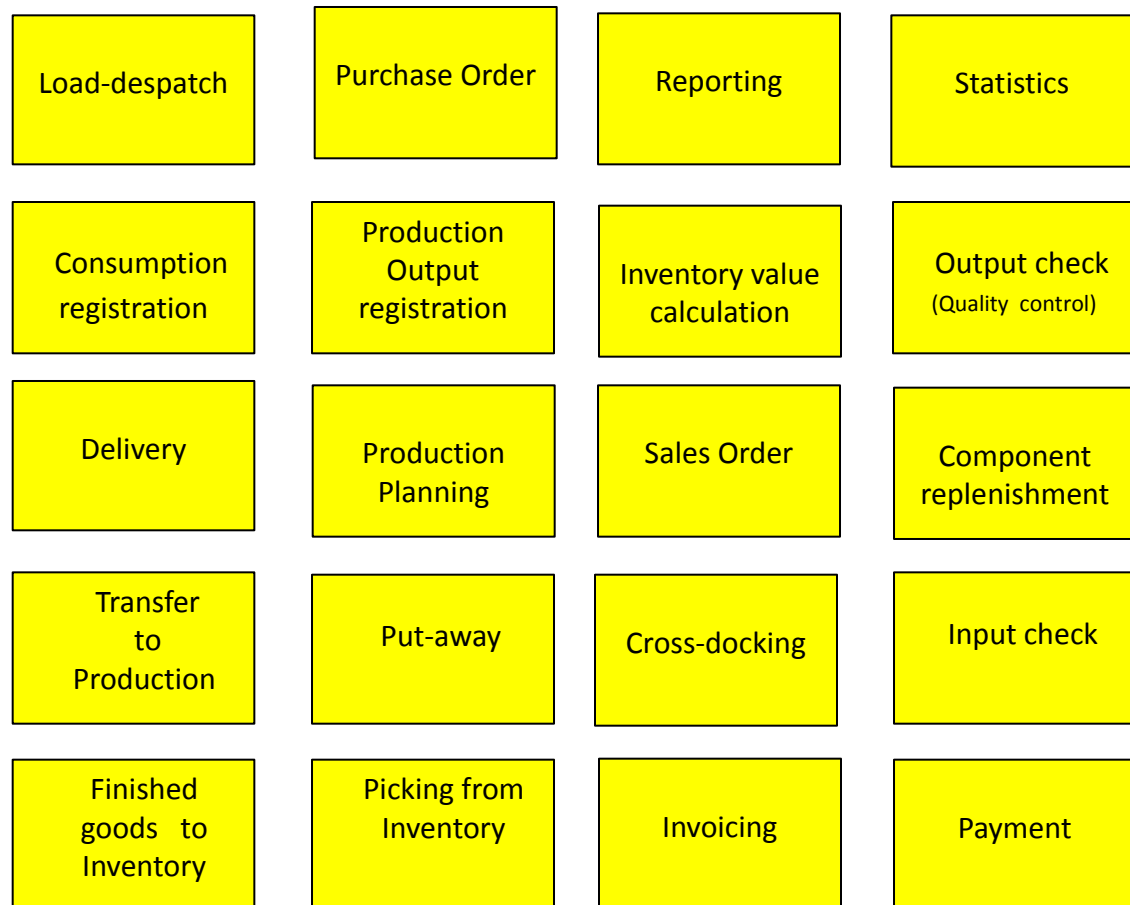


Procedures-simplified (feedback)

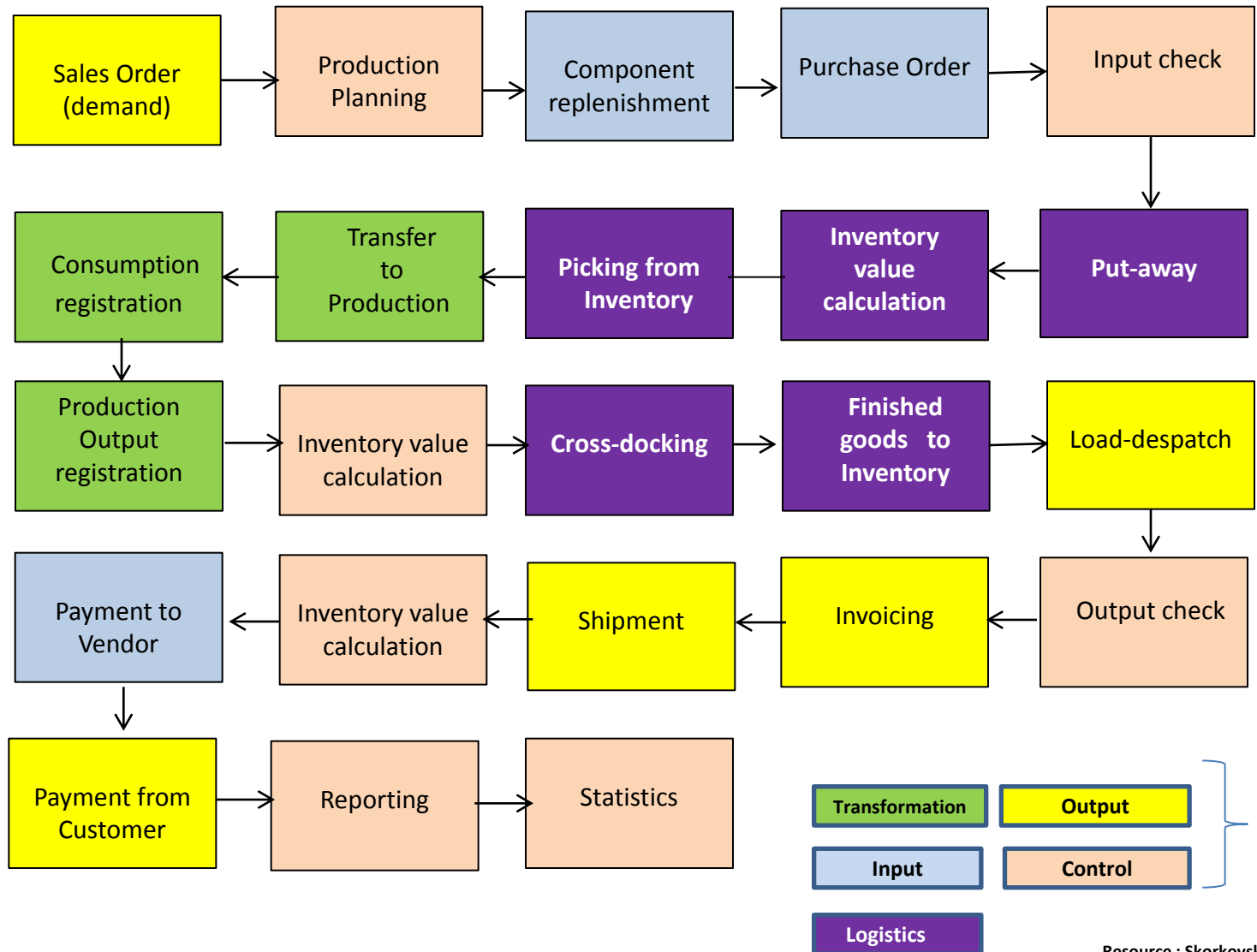


Processing

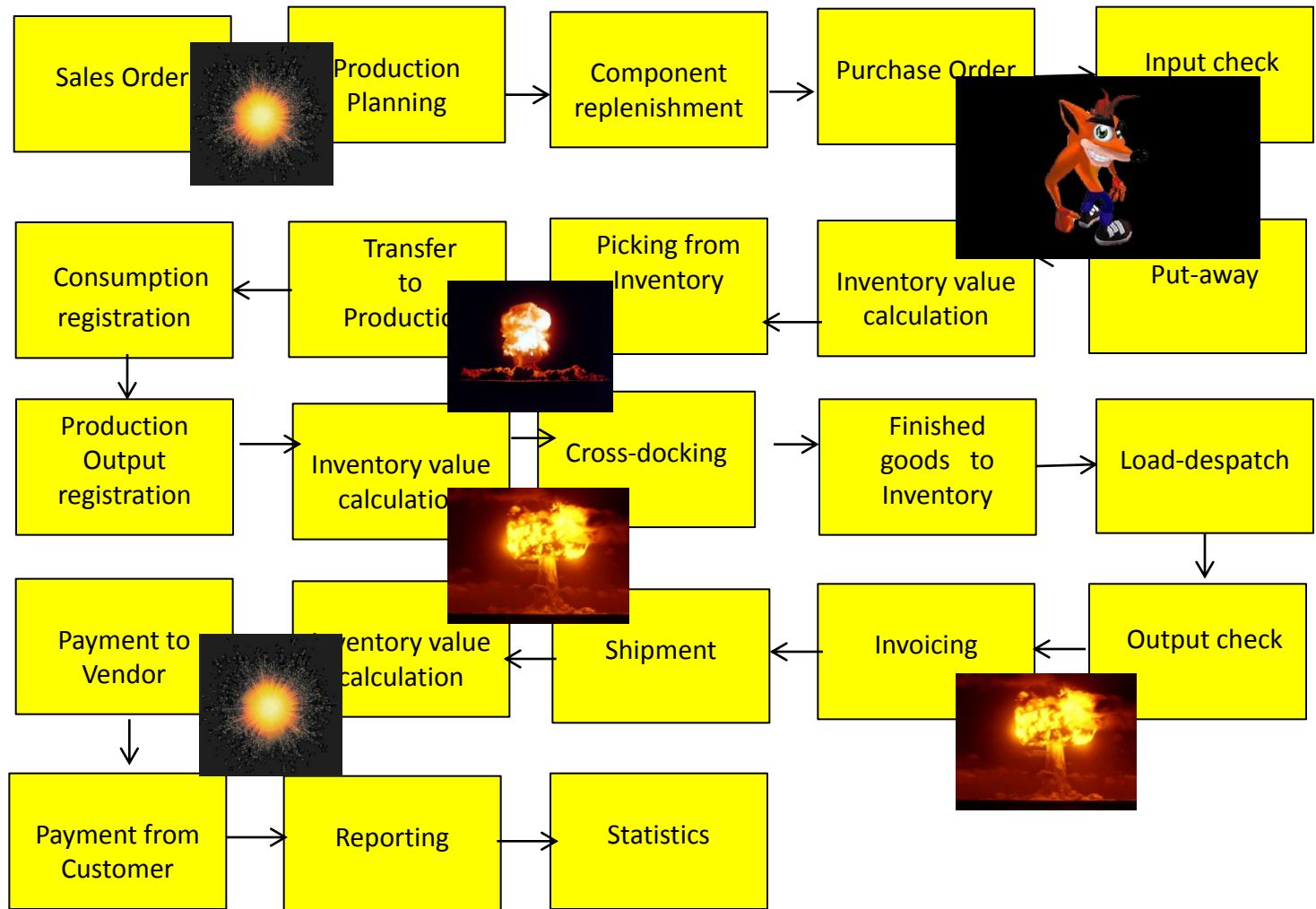
(not organised set of processes, will be presented also as a introduction to project management PWP presentation later)



Your main task (to organize processes based on business logic)



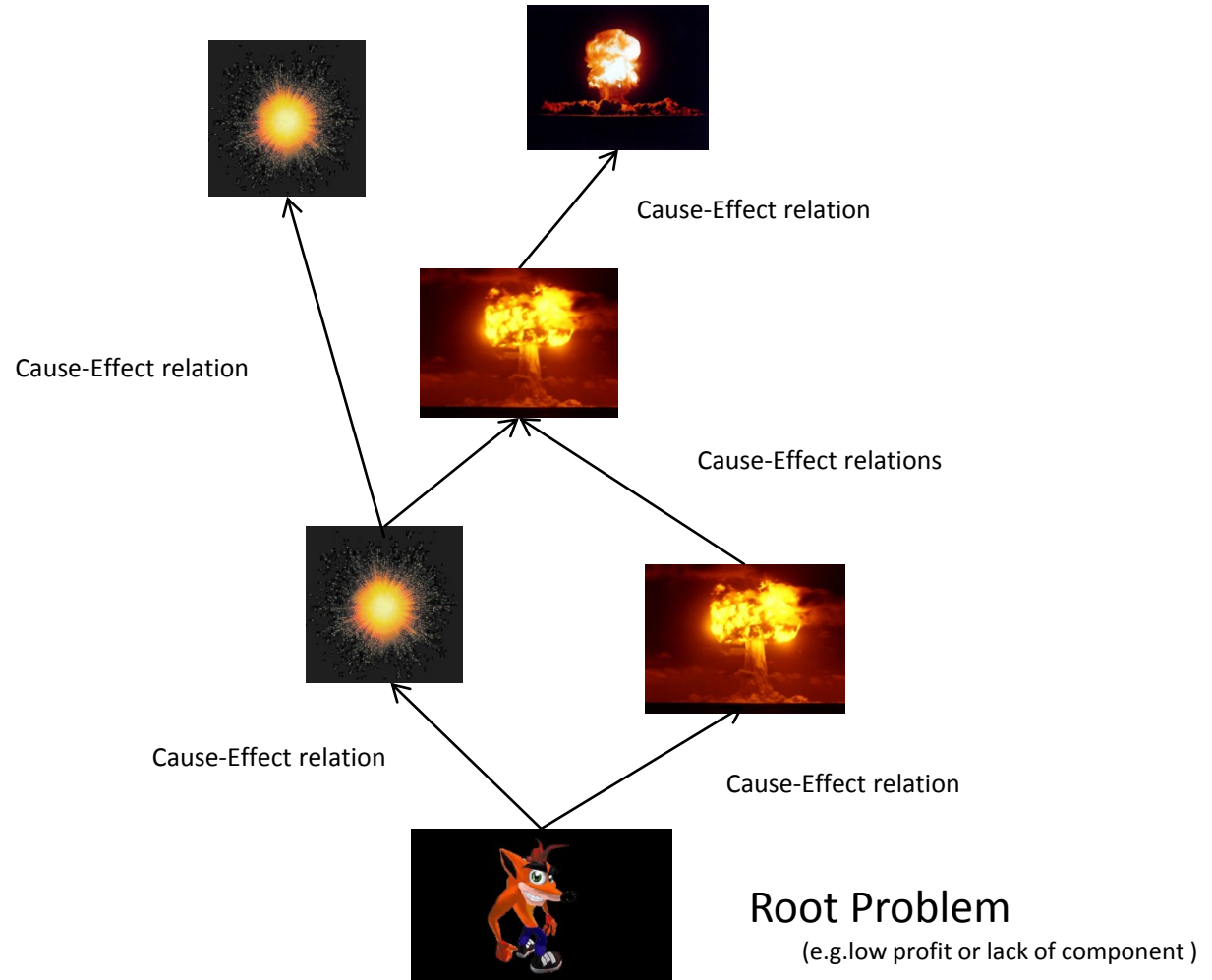
Your main task (possible problems, bottlenecks, undesirable effects..)



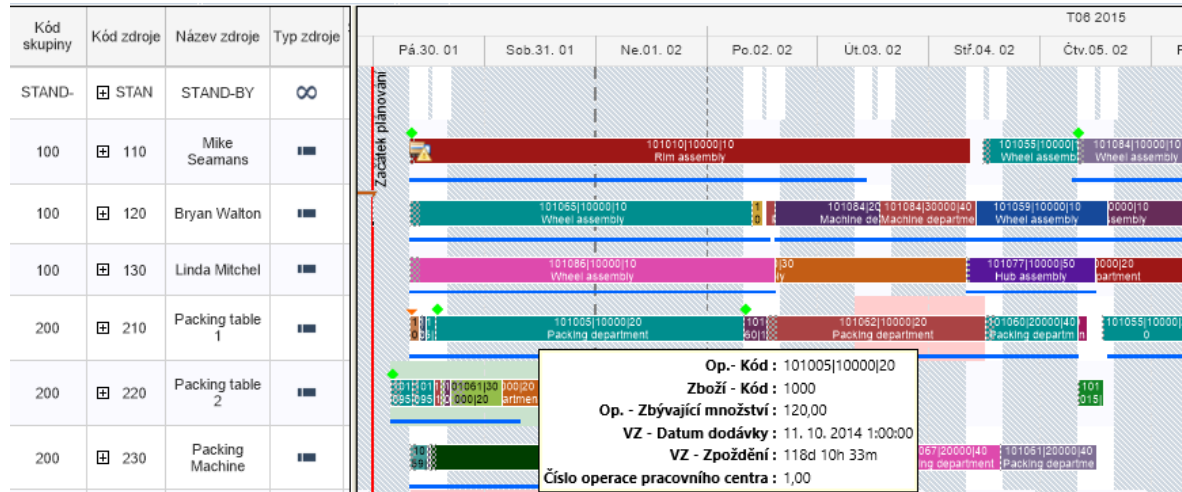
Application of TOC ->thinking tools->Current Reality Tree – first stage

Your main task

(Search - **HOW** ??? Measure impacts - **HOW** ??? and Destroy - **HOW** ???)



Basic problem I. (availability of components solved by product PlannerOne application)



Prod. Order Routing

Operati... No.	Type	No.	Description	Starting Date-Time	Ending Date-Time	Setup Time	Run Time	Material Fixed Date
10	Work Center	100	Wheel assembly	18. 8. 2014 14:41	22. 8. 2014 8:31	110	12	23. 8. 2014 0:00
20	Work Center	200	Packing department	27. 8. 2014 8:31	1. 9. 2014 14:46	15	15	10. 9. 2014 0:00
30	Work Center	300	Painting department	1. 9. 2014 14:46	4. 9. 2014 10:46	10	20	
40	Work Center	400	Machine department	4. 9. 2014 11:11	5. 9. 2014 12:21	10	8	

APS result ->18.8.->23.8. a 27.8.->10.9

Basic problem II-I. (over budget or under budget in our case)

2012 - Budget

General Filters Options

Budget Name 2012 ↑

Show as Lines. G/L Account ↑

Show as Columns Period ↑

Code	Name	Budgeted Amount	26.03.12	02.04.12
8100	Building Maintenance Expenses			
▶ 8110	Cleaning	1 160,00	1 000,00	
8120	Electricity and Heating	1 120,00	1 000,00	
8130	Repairs and Maintenance	1 160,00	1 000,00	
8190	Total Bldg. Maint. Expenses	3 440,00	3 000,00	
8200	Administrative Expenses			
8210	Office Supplies	510,00	500,00	
8230	Phone and Fax	800,00	800,00	
8240	Postage	1 390,00	1 200,00	
8290	Total Administrative Expenses	2 700,00	2 500,00	
8300	Computer Expenses			
8310	Software	1 000,00	1 000,00	

1 7 31 3 12 ⋮ ⏪ ⏩ Balance Functions Help



Basic problem II-II.

(over budget) – nákup služeb

1015 London Postmaster - Purchase Invoice

General Invoicing Shipping Foreign Trade E-Commerce

No. 1015 [edit] Posting Date 26.03.12

Buy-from Vendor No. 10000 [up] Document Date 26.03.12

Buy-from Contact No. CT000066 [up] Vendor Invoice No. Miki-0983

Buy-from Vendor Name London Postmaster Order Address Code. [up]

Buy-from Address 10 North Lake Avenue Purchaser Code RL [up]

Buy-from Address 2 Campaign No. [up]

Buy-from Post Code/City N12 5XY [up] London [up] Responsibility Center LONDON [up]

Buy-from Contact Mrs. Carol Philips Assigned User ID [up]

Status Open

Type	No.	Description	Location Code	Quantity	Unit of Measure ...	Direct Unit Cost Excl...	Line Amount Excl. VAT	Line Disco...	Qty. to Assign
G/L Ac...	8110	Cleaning		10	HOUR	100,00	1 000,00		
G/L Ac...	8120	Electricity and Heating		20	HOUR	200,00	4 000,00		
G/L Ac...	8130	Repairs and Maintenance		30	HOUR	300,00	9 000,00		
G/L Ac...	8210	Office Supplies		10	HOUR	100,00	1 000,00		
G/L Ac...	8230	Phone and Fax		20	HOUR	200,00	4 000,00		
▶ G/L Ac...	8240	Postage		30	HOUR	300,00	9 000,00		

Invoice Line Functions Posting Help

* Basic problem II-III. (over budget)

G/L Balance/Budget

Options

Date Filter 01.03.12..31.03.12 Budget Filter 2012

Department Filter Closing Entries Include

Project Filter

No.	Name	I... Debit Amount	Credit Amount	Balance/Budget (%)	Budgeted Debit Amount	Budgeted Credit Amount	Budgeted Amount
8100	Building Maintenance Expenses	L...					
▶ 8110	Cleaning	I... 1 000,00		100,0	1 000,00		1 000,00
8120	Electricity and Heating	I... 4 000,00		400,0	1 000,00		1 000,00
8130	Repairs and Maintenance	I... 9 000,00		900,0	1 000,00		1 000,00
8190	Total Bldg. Maint. Expenses	L... 14 000,00		466,7	3 000,00		3 000,00
8200	Administrative Expenses	L...					
8210	Office Supplies	I... 1 000,00		200,0	500,00		500,00
8230	Phone and Fax	I... 4 000,00		500,0	800,00		800,00
8240	Postage	I... 9 000,00		750,0	1 200,00		1 200,00
8290	Total Administrative Expenses	L... 14 000,00		560,0	2 500,00		2 500,00
8300	Computer Expenses	L...					
8310	Software	I...			1 000,00		1 000,00

1 7 31 3 12 Account Functions Help

Other problems (examples which could be solved are mentioned in PWP Project activities (Činnosti spojené s projektem))

Tuition –plan-theory

- OM-intro – done (this slide show)
- Real project-South African client (wholesale)
- Theory of constraints
- Critical chain and project management
- Quality management I. (Pareto+ Ishikawa)
- Quality management II. (Six Sigma, Kaizen, Poka Yoke)
- Business metrics (use of matrices – Boston, Gartner MQ)
- Balanced Score Card
- DBR , CONWIP
- Decision making (Kepner-Tregoe methodology,..)
- P&Q analysis (mix of products)
- Business Intelligence – intro and concept
- Little´s law
- Yield management – intro to concept
- Linear programming – concept and use
- Business Intelligence
- Decision trees

Tuition –plan-ERP used in OM

- ERP basics (principles) and ERP handling and installation
- Purchase – basic parameters and impacts of parameter setting (Stock, General Ledger)
- Sale - basic parameters and impacts of parameter setting (Stock, General Ledger, Discounts)
- Inventory – basics
- Transfers of items
- Banking operations (posting and payments)
- Customer Relationship Management
- Basic tools used for analysis of created transactions