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Information Systems 01PDWOV

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Books, notes are not allowed. Write only on these sheets.

Food delivery

Many restaurants offer a food delivery service. The customer selects a number of dishes from a menu, then calls the restaurant and orders the dishes. The restaurant prepares the dishes, packs them and delivers to the customer. Since a few years third party companies provide the selection and delivery service.

AS IS process
A restaurant R advertises its offer of dishes and prices (either by setting up an informational web site, or by diffusing leaflets in its area). The restaurant manager receives orders by phone. Each order is sent to the kitchen where it is prepared and packaged. Then another employee of the restaurant takes the package and delivers it, using a vehicle (bike, car or else) owned by the restaurant. The employee, upon delivery, receives the payment by the customer and returns to the restaurant.

TO BE process.
Company FOOD sets up the infrastructure: a web site and employees for delivery. A restaurant R defines a general agreement with FOOD. Usually FOOD collects a fixed fee for the delivery, and retains a 10-15% share of the restaurant bill. When the agreement is defined R uploads on FOOD's web site its offer (dishes and prices, operating hours, discount policies).
A customer accesses FOOD's web site, where she selects one of the restaurants (say R), selects dishes, gives her address, pays via credit card. The manager of restaurant R collects the order from FOOD's web site, passes the order to the kitchen that prepares and packages. An employee from FOOD collects the package and delivers to the customer.
The delivery employee uses an app to interact with FOOD. The customer, via the FOOD web site, can rate the service and add a tip for the delivery employee.

In the following model the TO BE situation.

1 Organizational model: list roles or organizational units involved

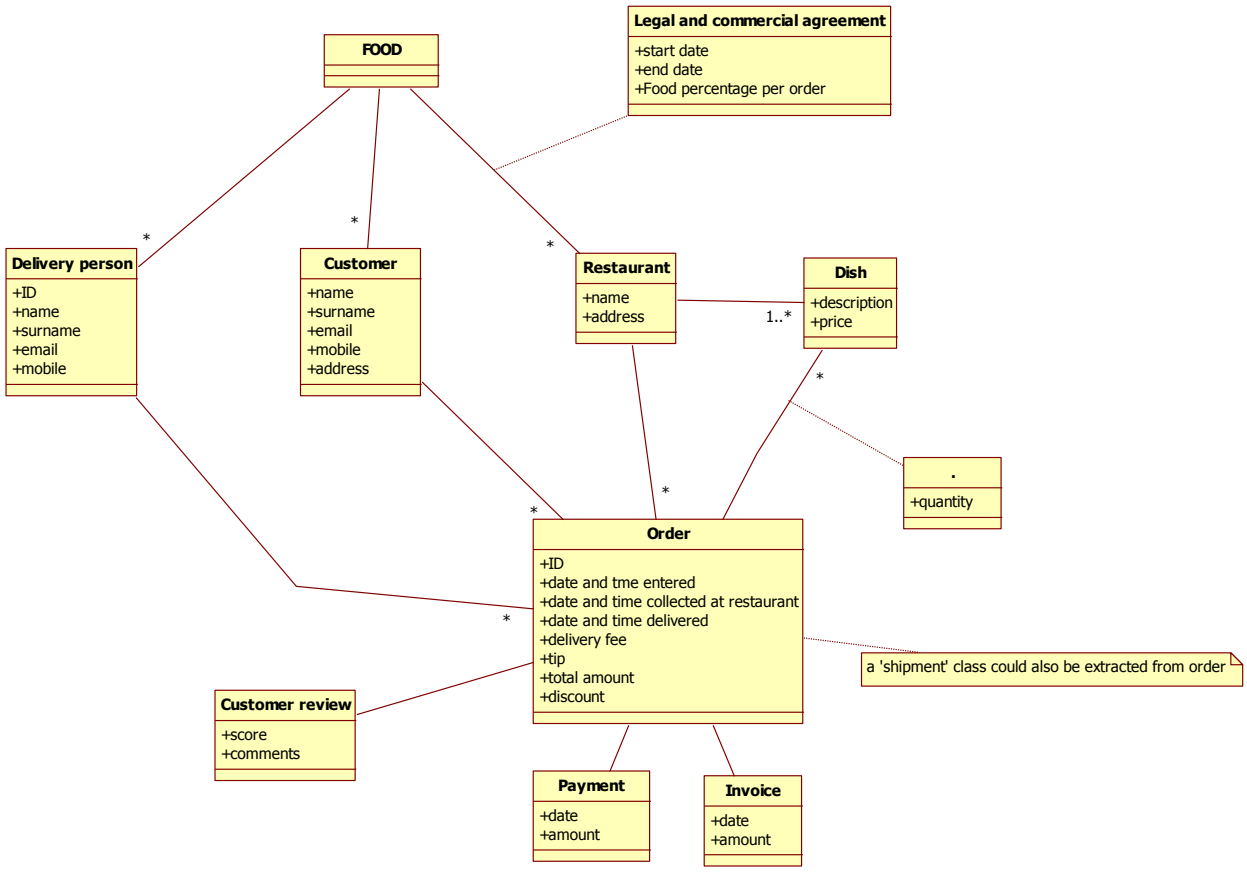
1 FOOD
- 1-1 Order collection
- 1-2 Delivery

2 R
- 2-1 Kitchen
- 2-2 Manager

3 Bank system
4 Customer

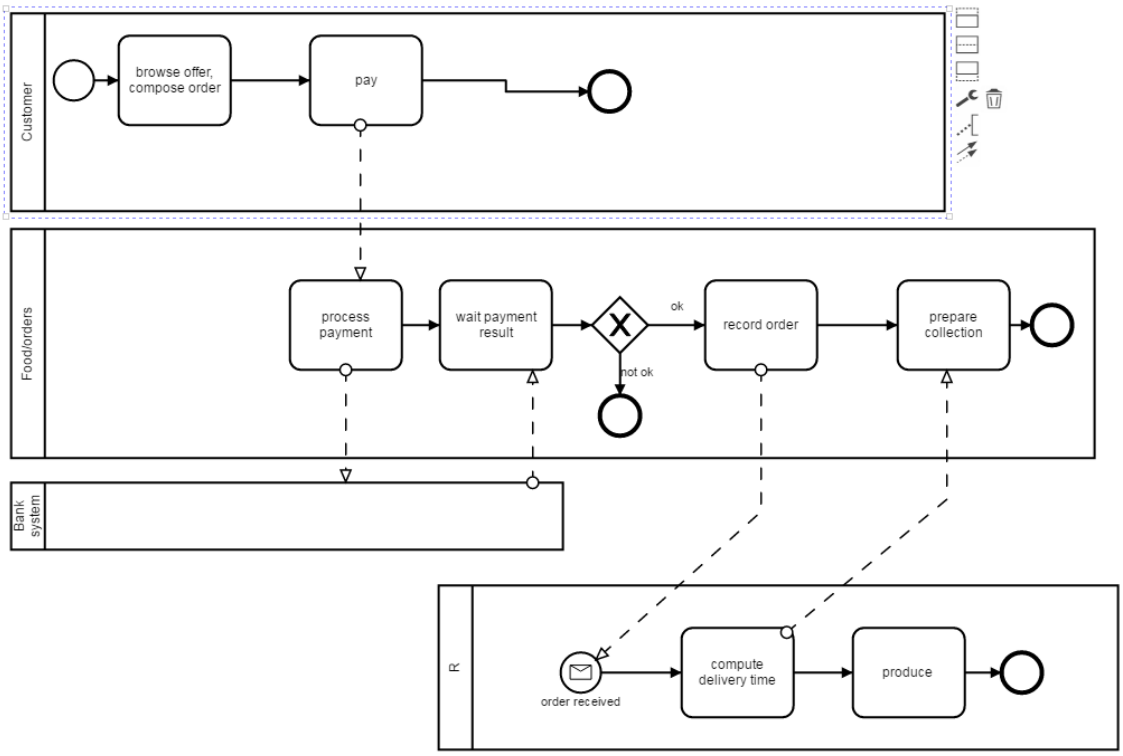
This is an inter-organizational case where more organizations (FOOD, restaurants, bank system) are involved

2 Functional model: Design and model (using BPMN + UML class diagram) the TO BE process

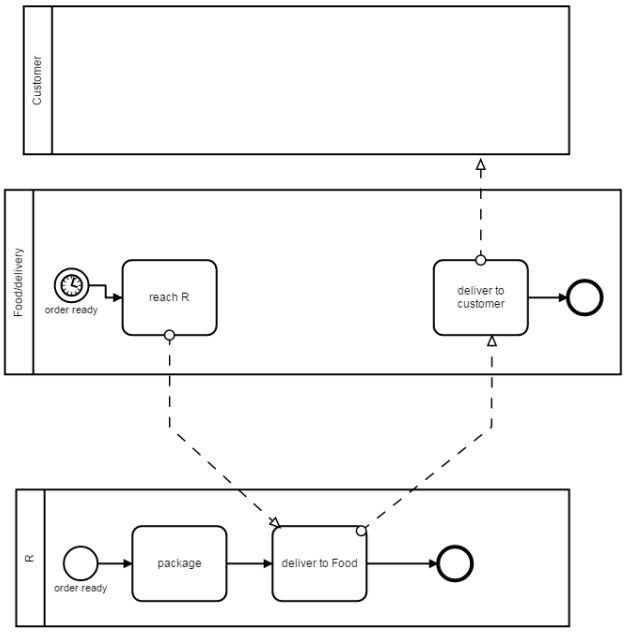


The process is a traditional order-to-cash (Vendor/producer: receive order, produce, pack, ship, invoice, receive cash), where two main organizations collaborate (R and Food). The process can be split in three subprocesses, receive order and payment (Food), produce pack (R), deliver (Food). Do Review and Make tip are two other subprocesses that may or may not happen. Two other subprocesses happen preliminarily, R signs an agreement with Food and uploads its offer (menu and prices), Customer opens an account with Food.

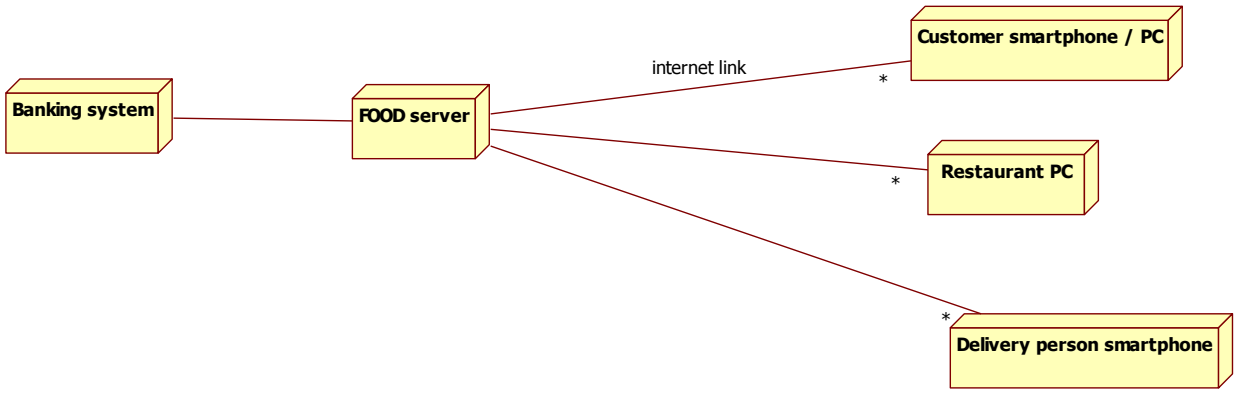
Remark that Food interacts with the Payment system, not the Customer


Customer
browse offer, compose order
pay
Food/orders
process payment
wait payment result
ok
not ok
record order
prepare collection
Bank system
R
order received
compute delivery time
produce

Delivery


Customer
Food/delivery
order ready
reach R
deliver to customer
R
order ready
package
deliver to Food

3-a IT Model / Technological model: describe the hardware architecture of the system (UML deployment diagram)



3-b Business rule: define (in English, or formally) at least one business rule for the process

Food's share on order = 15% Order.total amount

Customer's distance from restaurant < 10km

Order.total amount >= 10 euro

5 Define the KPIs, considering these high level business goals (or CSF), CSF1 increase customer satisfaction, CSF2 reduce the cost of the process for the restaurant R and company FOOD.
If needed, define also indicators that are not KPIs.
Remember that, from the customer point of view, there is one end to end service (order to delivery), but behind the service are two companies, R and FOOD and therefore two cost and profit centers.
In other words there are 3 points of view to consider: customer, R, FOOD

Food

CSF name	KPI Category (General, cost ..)	KPI Name	KPI Description	Unit of measure
	General	O	Input volume: orders per year, per all restaurants	
	General	O_c	Output volume: orders completed per year per all restaurants	
CSF1	Service	LT	Lead time order, from order start to delivery = LT order + LT production + LT delivery	T
		LT order	From customer starts order to payment completed and order accepted	T
		LT production	From restaurant receives order from Food to order packaged and ready to be collected	T
		LT delivery	From package collected at restaurant to package delivered to customer (should also be weighted on distance → LT delivery / (distance R to customer)	T
CSF2	Efficiency	UC_food	Unit cost order management = UC order + UC delivery	Euro
		UC order	Infrastructure cost / O Infrastructure cost = development and maintenance of web server (prorata order and payment functions) Possibly also review and agreement functions are considered here	Euro
		UC delivery	(Salary of all delivery employee + infrastructure cost) / O_c Infrastructure cost = development and maintenance of App + development and maintenance of web server (pro rata with delivery functions) (possibly cost of vehicles / bikes, unless they are property of delivery employees)	Euro
CSF1	Quality	Defects	% orders with defects Defect = wrong dishes, bad taste, ..	%
CSF1		Punctuality	Actual delivery time / estimated delivery time Ex target could be 90% of orders are delivered within +/- 10% of estimated time	%

R

CSF name	KPI Category (General, cost ..)	KPI Name	KPI Description	Unit of measure
	General	O_R	Input volume, orders per year, per R restaurant	
		O_c_R	Output volume, orders completed per year per R restaurant	
CSF1	Service	LT production	From restaurant receives order from Food to order packaged and ready to be collected (same as above)	T
CSF2	Efficiency	UC_R	Unit cost order management = UC order_R + UC delivery_R (UC MUST NOT include cost of food)	euro
CSF2	Efficiency	UC order _R	Time for manager to handle orders by phone (and / or cost of web site managed by R to collect orders)	euro
CSF2	Efficiency	UC delivery_R	15% fee to FOOD (cost of vehicles + effort of employee to deliver in as is)	euro
CSF1	Quality	Defects	Same measure defined at Food level, but restricted to R orders	%
CSF1		Punctuality	Same measure defined at Food level, but restricted to R orders	%

Customer

Is especially sensible to LT (as defined for Food), defects, punctuality.

Important measures to be considered in this case, *that are not KPIs*

SR Selection of restaurants for the customer: number of restaurants a customer can select from

CA Customer audience for a restaurant: number of customers a restaurant can reach

U usability of web site

FU follow up on customer satisfaction (via web site etc)

6 Compare the previous and the current situation, using the KPIs defined above

The comparison is limited to R, and customer since FOOD was not existing in the AS IS

KPI	AS IS	TO BE
LT order		Assuming R had a web site or call center in the As is, no big change (on the other hand U could increase)
LT production		No change
LT delivery		Outsourced to FOOD, depends on how Food can manage this, especially on peak hours
CA		Definitely much higher (assuming Food is one of the largest players)
O_R		May increase (given CA larger) if R is capable of good positioning vs competitors
U		Probably much higher, since Food can use best practices and best people to continuously improve it
SR		Much higher
UC_R		Assuming that R had an ecommerce web site in the As is, the

		variation in UC_R depends on O_R. Since the cost of the web site is a fixed cost, it will be proportionally a higher cost for small restaurants (small UC_R) and a lower cost for large restaurants. So large restaurants could see an increase in UC_R (since the 15% fee is proportional to O_R, i.e. the turn over). In summary small restaurants may find cheaper to collaborate with Food, the opposite for large restaurants. However also CA should be considered.
FU		Much better, as for U FOOD can use best practices to follow up customer satisfaction.

7 Considering the company FOOD and the infrastructure they have to build (web site, app for delivery employee), define the software functions needed, starting from the BPMN activities you have identified in question 2

Activity in BPMN	**Software function(s) needed**
Compose order	define customer, create customer account authorize authenticate customer Show restaurant, show offer of restaurant, select restaurant, create order, select/modify dish
Process payment	Get credit card attributes, interact with credit card company
Reach R	Select employee for delivery, transmit to employee delivery attributes (R address, time for pick up, delivery address, delivery recommended path)
Deliver	Record collection of package, navigate to address, record delivery of package
Tip	Select order, select tip amount
Rate	Select order, rate delivery, rate food

Remember software functions are quite low level, and could be offered by one or more software applications.

8 Considering the comparison in point 6, summarize pros and cons for the 3 actors in the TO BE situation

	PROS	CONS
Customers	SR increases (without FOOD customer should hit a web site per restaurant, assuming the restaurant has a web site) Due to competition, cost of food could also decrease	
R	No need to set up an ecommerce web site (outsourced to FOOD), can focus on core business (cooking) No need to care for delivery (outsourced to FOOD) CA increases FU is feasible with high level of detail, R can keep satisfaction level of customer under strict control	Given the larger SR, R is in competition with a larger set of restaurants UC_R could be higher (because proportional to O_R), but the cost could be recovered by increasing input volume (and therefore turnover) FU also subject to risk of fake reviews
FOOD	As for all platforms (uber, booking, airbnb..) the platform is the winner, since it owns the customer base without heavy investment in non IT infrastructure (in this case restaurants)	

9 A manufacturing company has an engineering department. Here engineers use a program like Autocad (produced by AutoDesk) for doing technical drawings. The engineers use PCs owned and maintained by the company. The technical drawings are stored on a cloud storage service like Dropbox. Frame this case in terms of the outsourcing dimensions.

Three objects must be considered: engineering program (Autocad), storage service (Dropbox), PCs

	object	unicity	location
Autocad - outsourced	Application	Not unique	On site
Dropbox – outsourced	IT infrastructure	Not unique	Off site
PCs - insourced	IT infrastructure	Not unique	On site

10 Define ‘network effect’ (or demand side economy of scale) and give an example of it

Value of service depends on number of users, and grows way more than linearly with number of users. Ex telephone network, social network

(this question was NOT ‘define economy of scale’)

11 When doing process redesign, four dimensions should be considered. (Lead) time, cost, quality and flexibility. Define the meaning of ‘flexibility’ in this context.

Capability of process to react (possibly with no changes on time cost quality) to changes in workload (input / output volume), resources (ex employees, machines) needed, customer needs.

12 Given an organization with functional structure, the IT area could be centralized or decentralized. Explain pros and cons of a centralized IT area.

See slides

13 List the possible Customer relationship modes according to the Business Model Canvas

See slides