

物流系统及其构成

上海海事大学物流研究中心

本章大纲

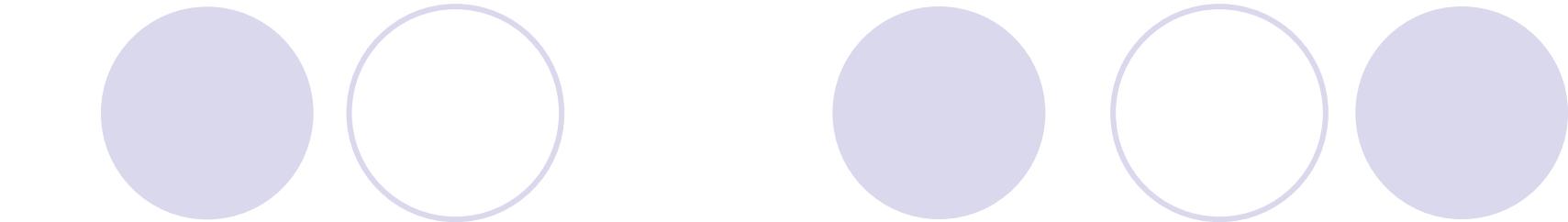
- 物流系统概述
- 物流系统的构成
- 物流系统分析

物流系统概述

- 物流系统概念及其功能
- 物流系统中存在的制约关系
- 物流系统的模式
- 物流系统设计要素
- 物流系统优化目标

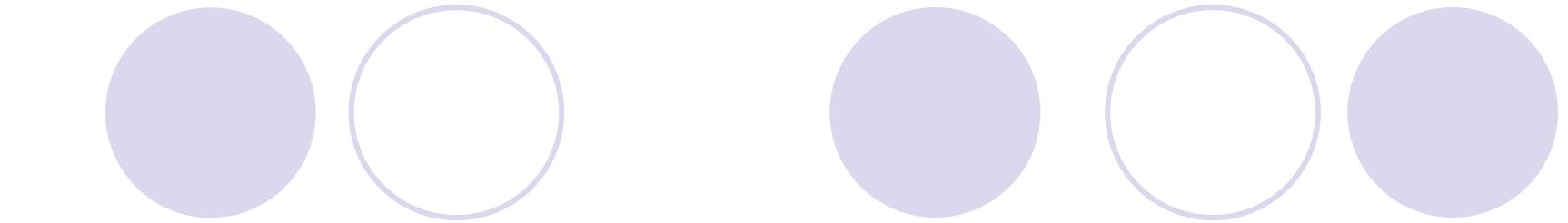
- **物流系统**是由运输、仓储、包装、装卸搬运、配送、流通加工、物流信息等各环节所组成的，这些环节也称为物流的子系统。
- **物流系统化**就是把物流的各个环节（子系统）联系起来看成一个物流大系统进行整体设计和管理，以最佳的结构、最好的配合，充分发挥其系统功能、效率、实现整体物流合理化。

- 物流信息化程度低，信息系统功能欠完善，有信息系统39%、无信息系统69%，可以看出物流企业的信息化普及率不高，多数物流企业还处于以往的人工作业方式。
- 仓储工作管理38%、[库存管理](#)31%、运输管理27%、财务管理38%、其他30%
- 从物流企业的信息系统应用来看，涉及了物流企业运营的各个环节，说明物流企业对信息化发展的需求呈现多样化的特点。
- 远程通信功能26%、业务管理37%、查询功能34%、决策分析17%
- 从企业的信息系统功能角度来看，物流企业的信息系统存在功能简单、功能层次低等问题。多数信息系统只有简单的纪录、查询和管理功能，而缺少决策、分析、互动等功能。

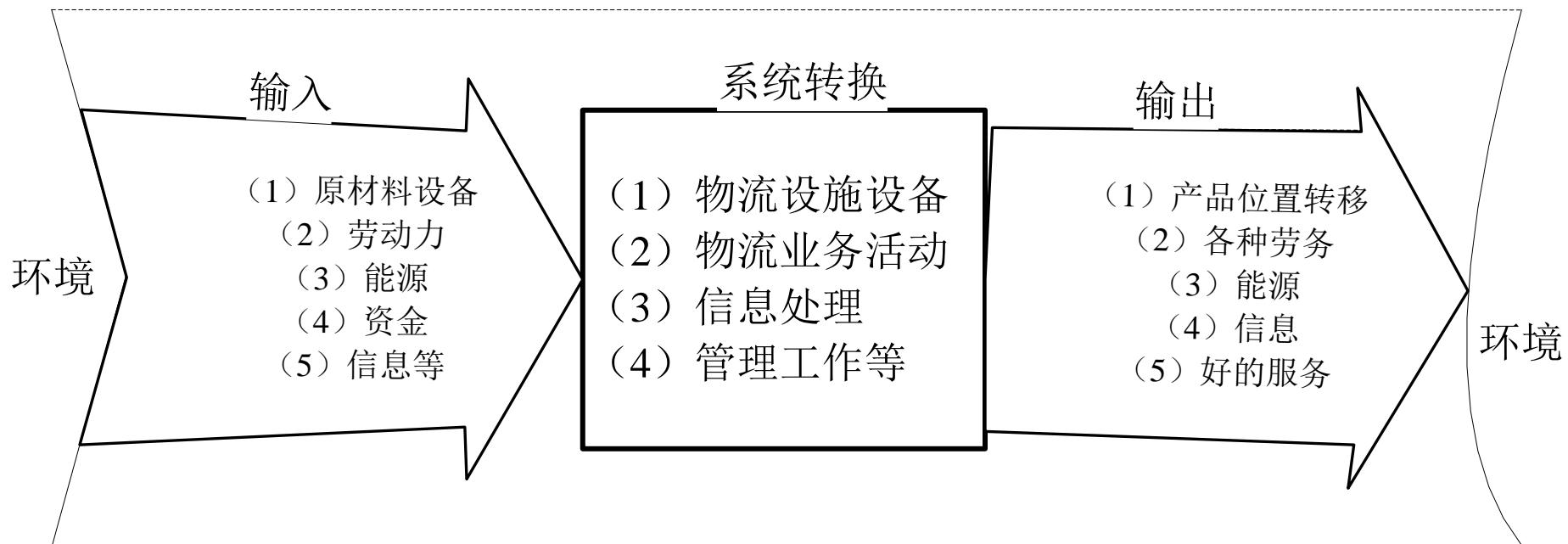


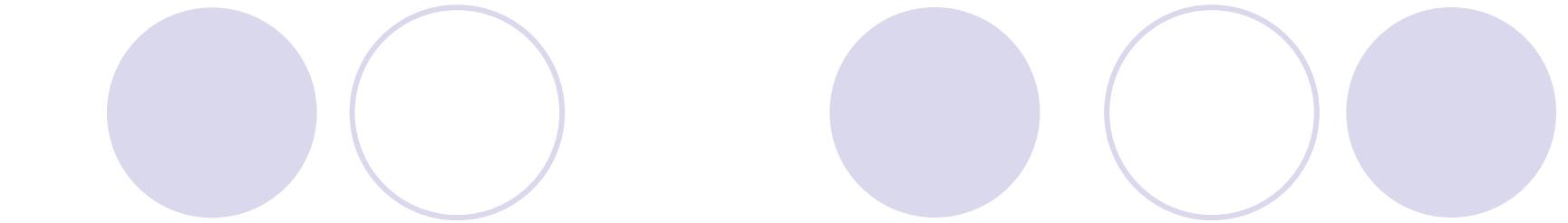
- 物流系统中存在的制约关系

- 物流服务和物流成本之间的制约关系
- 构成物流服务子系统功能之间的约束关系
- 构成物流成本的各个环节费用之间的关系
- 各子系统的功能和所耗费用的关系



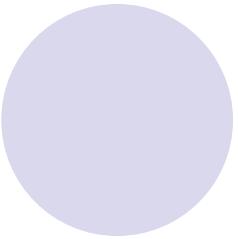
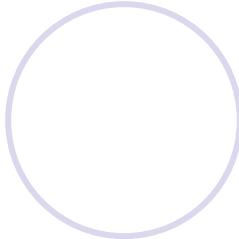
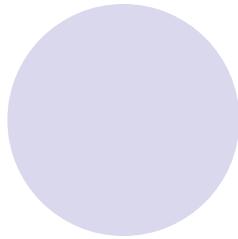
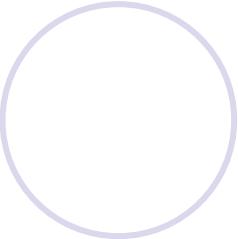
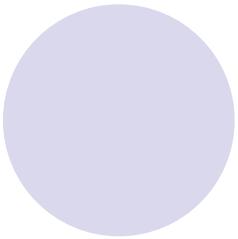
● 物流系统的模式





● 物流系统设计要素→PQRSTC

- 商品的种类和品目(Products)
- 商品的数量(Quantity)
- 商品的流向(Route)
- 服务水平(Service)
- 时间(Time)
- 物流成本(Cost)

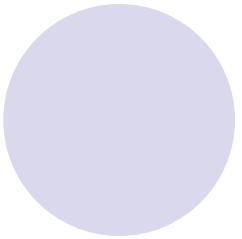
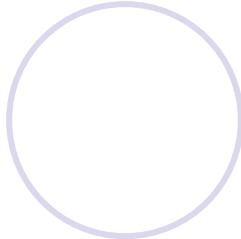
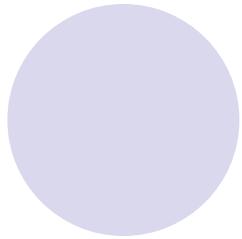
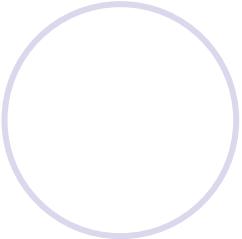
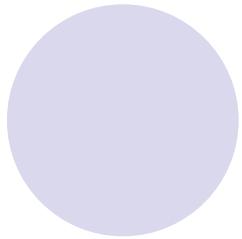


● 物流系统优化目标→5S

- 服务性(**Service**)
- 快捷性(**Speed**)
- 有效利用面积和空间(**Space saving**)
- 规模适当化(**Scale optimization**)
- 库存控制(**Stock control**)

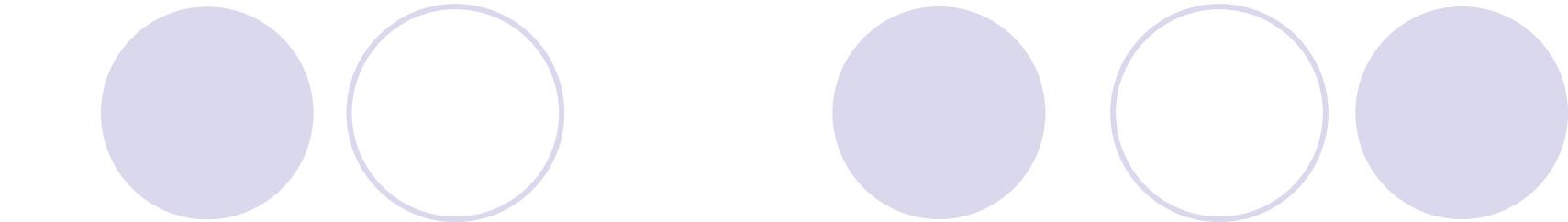
物流系统的构成

- 运输
- 仓储
- 装卸搬运
- 包装
- 流通加工
- 配送
- 物流信息



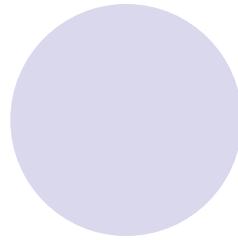
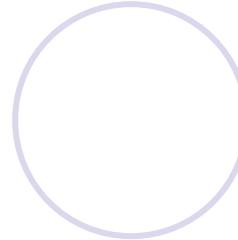
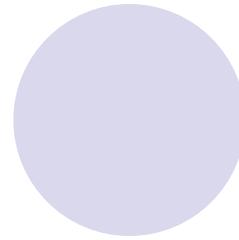
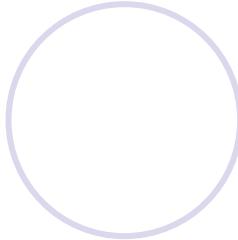
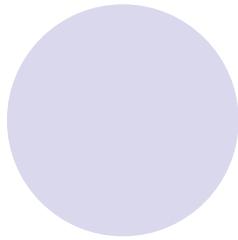
● 运输方式及特点

- 铁道
- 公路
- 水路
- 航空
- 管道



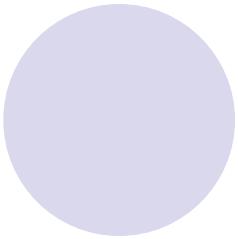
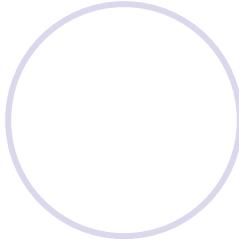
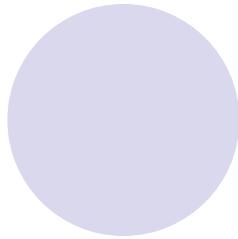
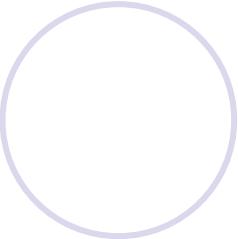
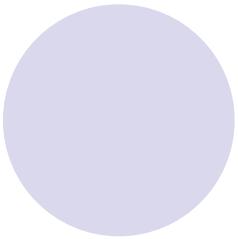
- **运输合理化的途径**

- 运输网络的合理配置
- 选择最佳的运输方式
- 提高运行效率
- 推进共同运输
- 采用各种现代运输方法

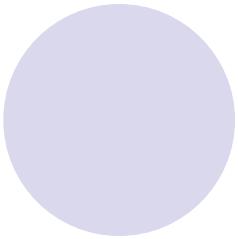
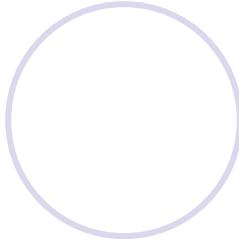
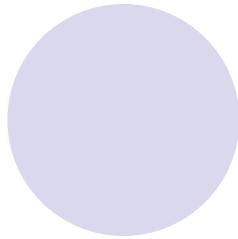
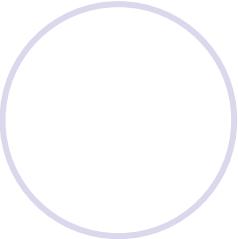
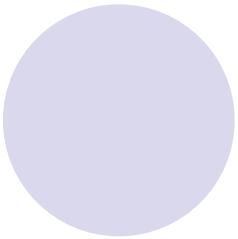


● 仓储的作用和意义

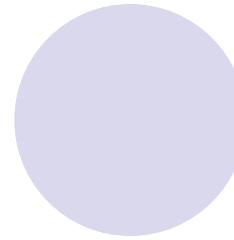
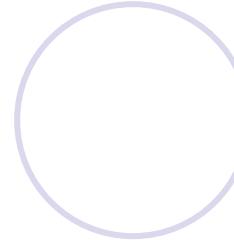
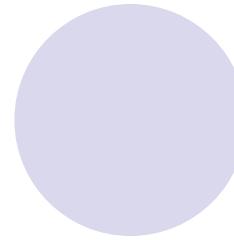
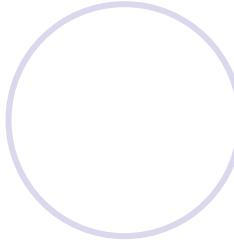
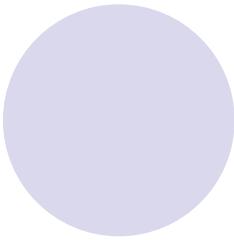
- 起着缓冲、调节和平衡的作用，克服产品生产和消费在时间上的差异，创造商品的时间价值和使用价值。
- 仓储和运输是物流活动的两大支柱。



- 仓库的功能
 - 储存和保管
 - 调节供需
 - 调节货物运输能力
 - 配送和流通加工

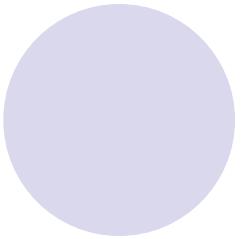
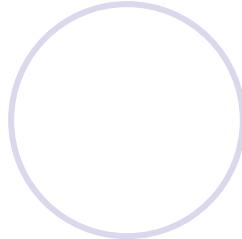
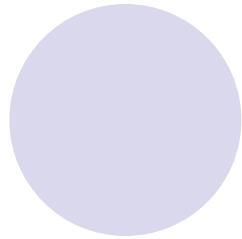
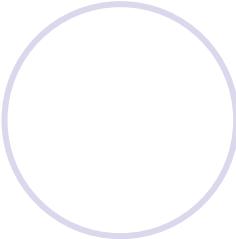
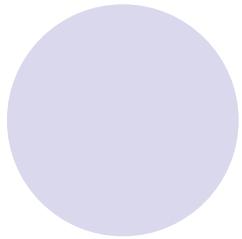


- 仓储合理化
 - 实行ABC管理
 - 科学的库存管理控制
 - 应用预测技术



● 装卸搬运的意义

- 装卸搬运在物流活动转换中起承上启下的联接作用，本身不具有明确的价值
- 装卸搬运在物流成本中占有重要地位
- 装卸搬运是提高物流系统效率的关键



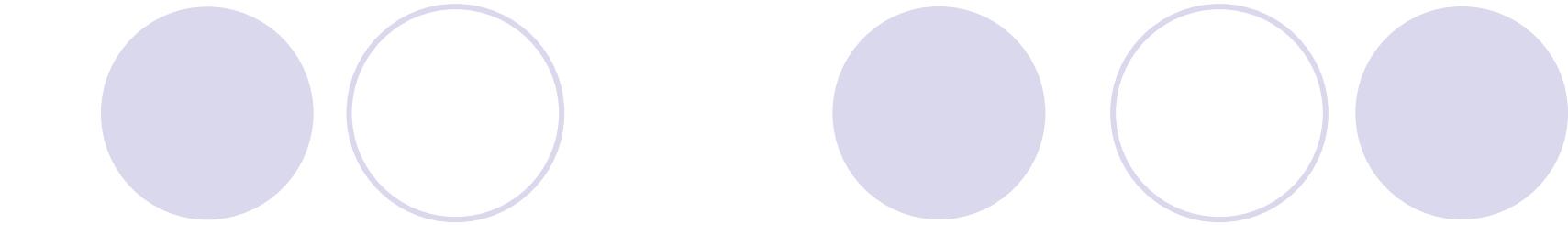
- **装卸搬运作业的构成**

- 堆放拆垛作业

- 配货作业

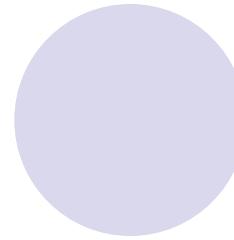
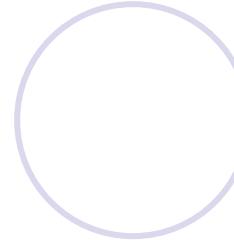
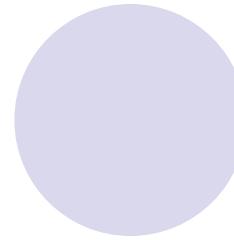
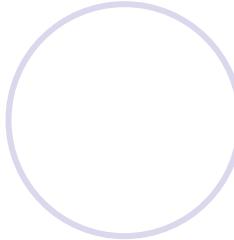
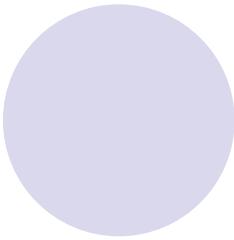
- 搬送、移送作业

- 其他作业：贴标签、栓卡片、分装等

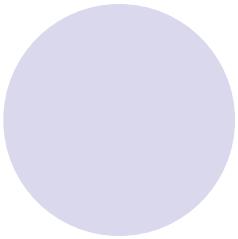
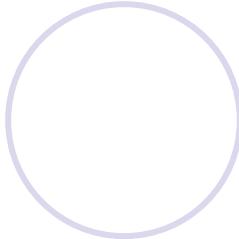
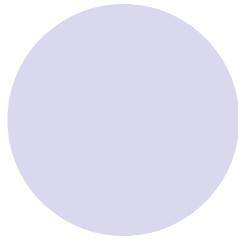
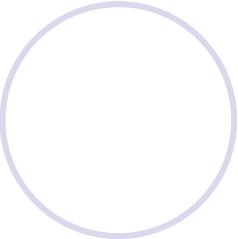
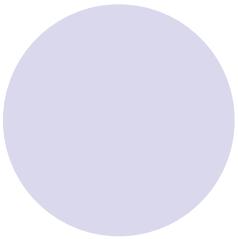


● 装卸搬运作业合理化的原则

- 省力化
- 消除无效搬运
- 提高搬运活性
- 合理使用机械
- 保持物流的均衡顺畅
- 集装单元化
- 人性化
- 提高综合效果

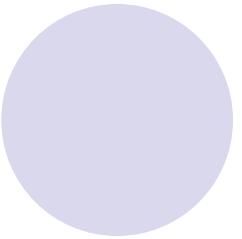
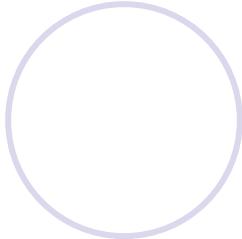
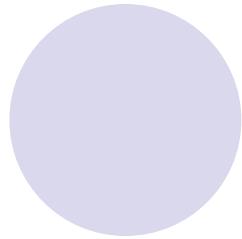
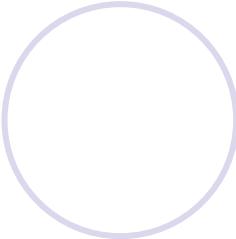
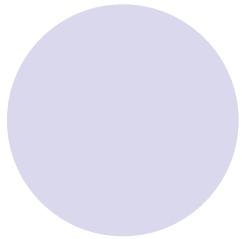


- 包装是生产物流的终点，同时也是社会物流的起点。
- 包装的目的和意义
 - 保护产品
 - 便于储运
 - 促进销售



● 包装的分类

- 按功能分： 工业包装、商业包装
- 按大小分： 单个包装、内包装、外包装



● 包装材料

○ 纸和纸板

○ 木质

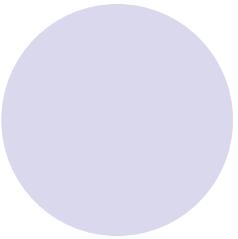
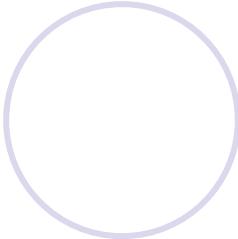
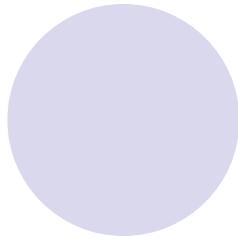
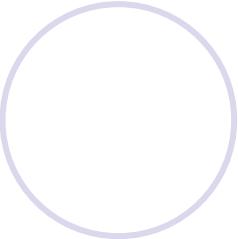
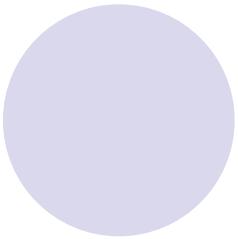
○ 金属

○ 塑料

○ 玻璃、陶瓷

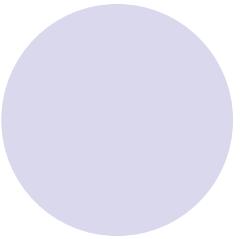
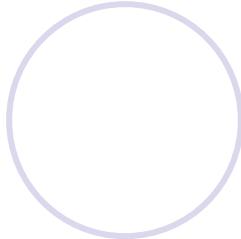
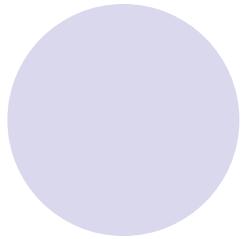
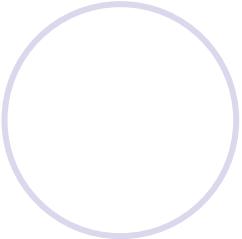
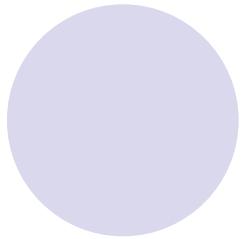
○ 复合材料

○ 辅助材料

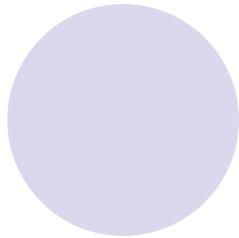
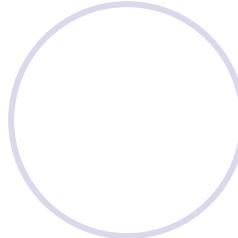
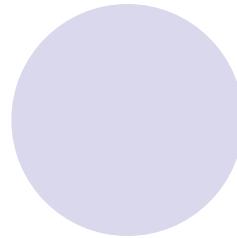
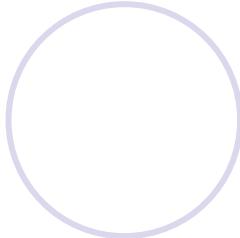
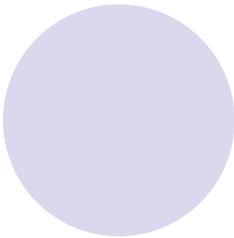


● 包装合理化

- 轻薄化
- 单纯化
- 符合集装单元化和标准化的要求
- 机械化与自动化
- 注意与其他物流环节的配合
- 有利于环保

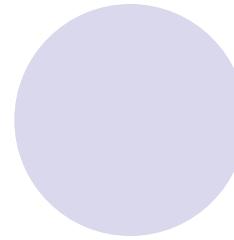
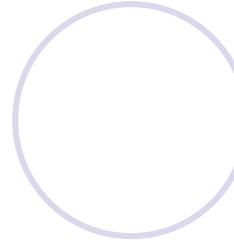
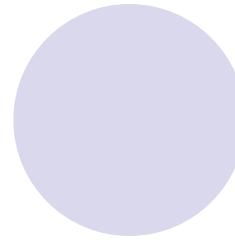
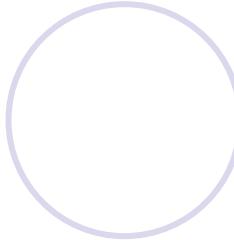
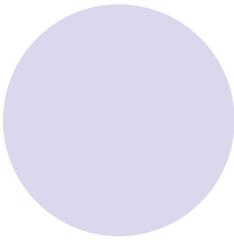


- 流通过程中的辅助性的加工活动称为流通加工。
- 流通加工是在生产的基础上增加商品的附加价值，它在生产者和消费者之间，起着承上启下的作用。



● 流通加工的目的——附加价值

- 为了运输方便
- 为了满足用户多样化的需求
- 为了综合利用



● 流通加工的形式及作用

○ 钢卷剪切

○ 水泥

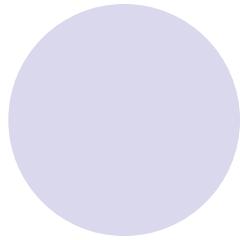
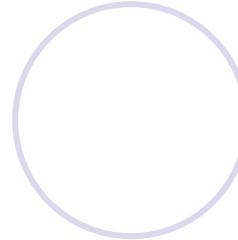
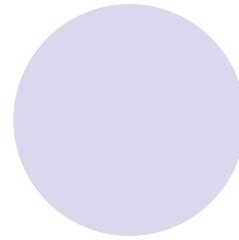
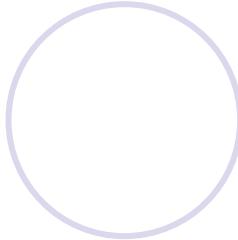
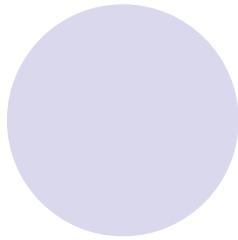
○ 玻璃

○ 自行车、助动车

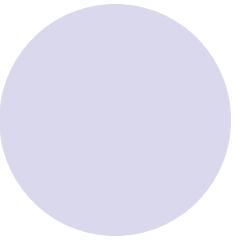
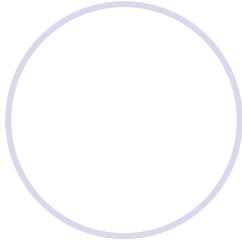
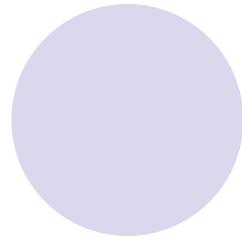
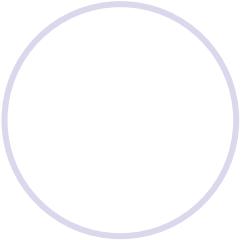
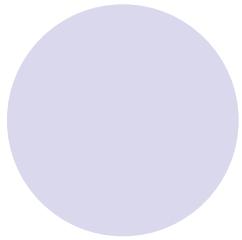
○ 服装、书籍

○ 水产品、肉类、蔬菜、水果等

○ 酒类

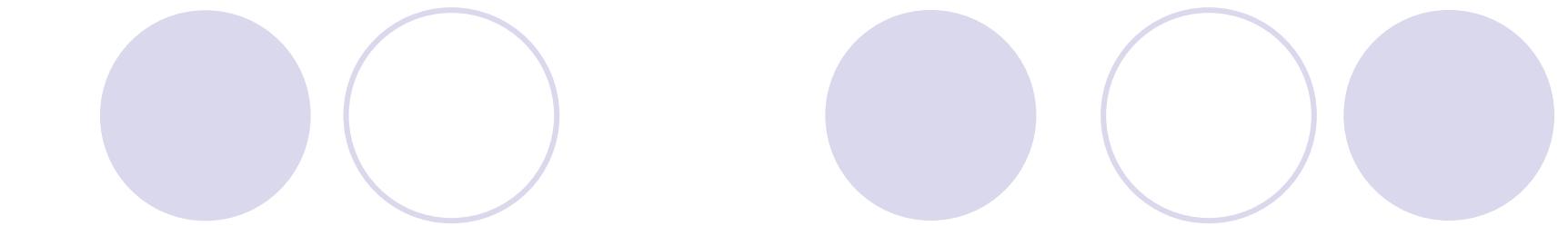


- 配送与运输的概念有时难以准确划分
 - 配送处于“二次运输”、“末端输送”的地位，与运输相比，更直接面向并靠近用户。



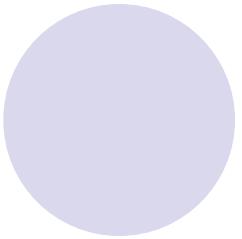
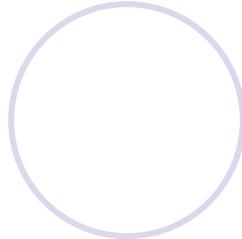
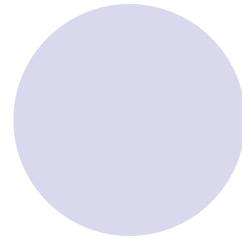
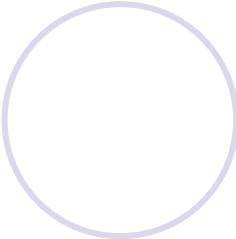
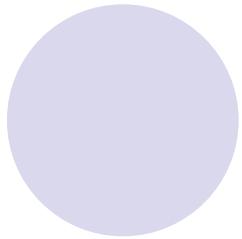
● 配送的特点

- 配送是从物流据点至用户的一种送货形式
- 配送不是单纯的运输或输送，而是运输与其他活动共同构成的组合体
- 配送是供给者送货到户式的服务性供应，是一种“门到门”的服务
- 配送是全面配货基础上，完全按用户要求所进行的运送，是配和送的有机结合形式



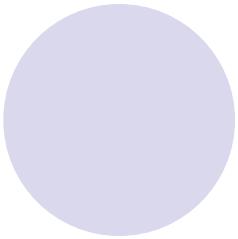
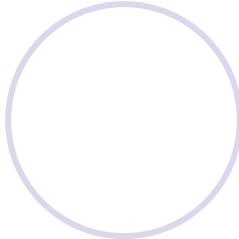
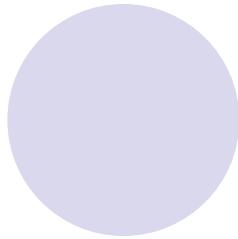
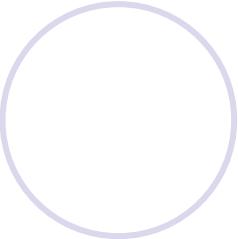
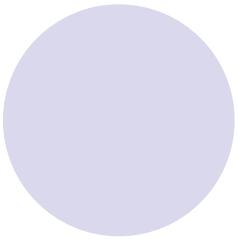
● 配送的意义和作用

- 完善了输送及整个物流系统
- 提高了末端物流的经济效益
- 通过集中库存，可使企业实现低库存或者零库存
- 简化手续，方便用户
- 提高了供应保证程度



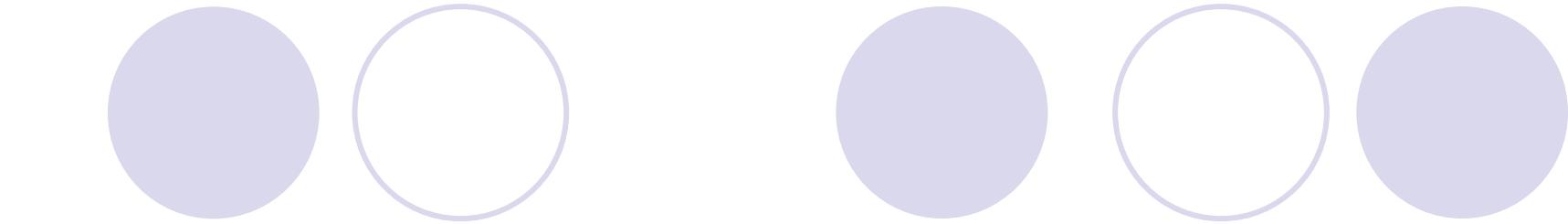
● 配送的分类

- 按配送组织者分类：企业内部配送、企业之间配送、企业对消费者配送
- 按配送时间及数量分类：定时配送、准时制配送、定量配送、定时/定路线配送、共同配送



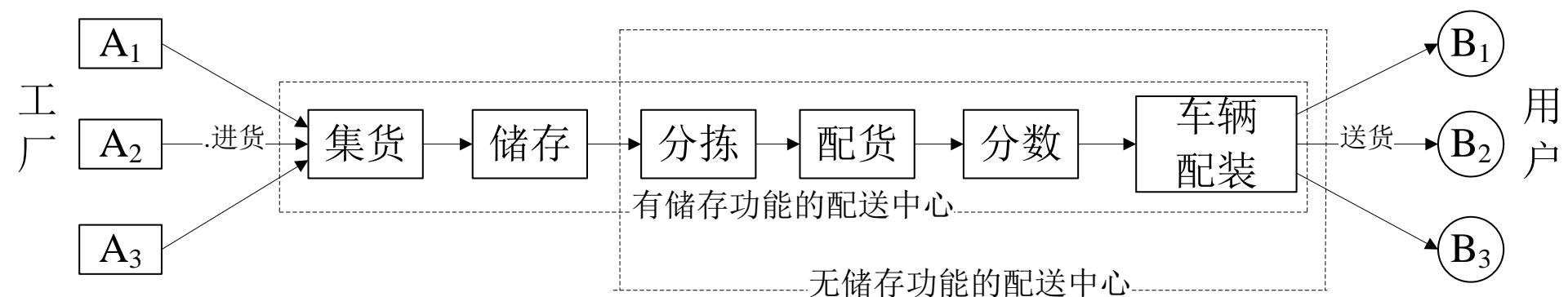
● 配送方法

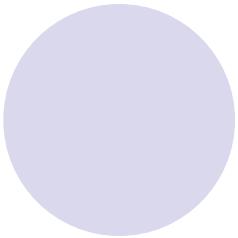
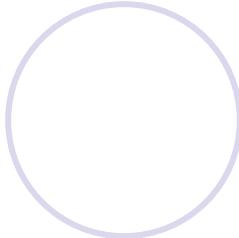
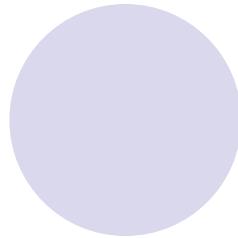
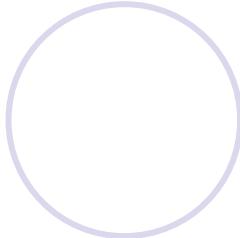
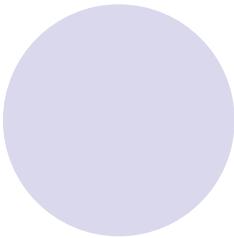
- 配货作业方法：分货方式（播种）、拣选方式（摘果）
- 车载货物的配装
- 配送路线的确定：确定优化目标——确定约束条件——建模求解



● 配送中心的类型

- 有存储功能的配送中心
- 仅有配送功能而没有存储功能的配送中心





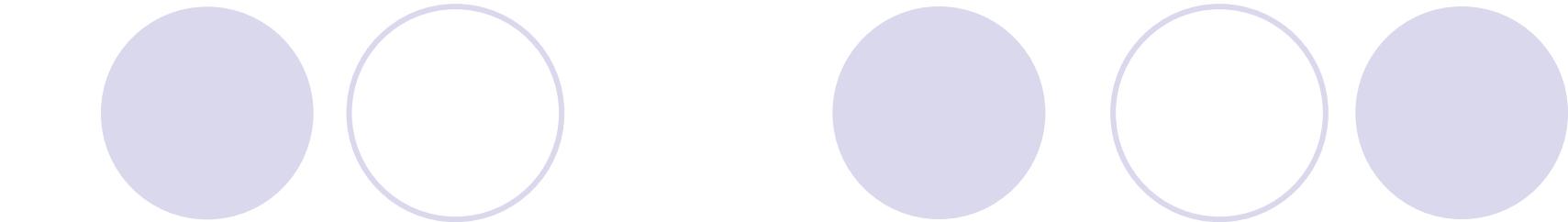
● 配送中心的功能

○集货

○储存

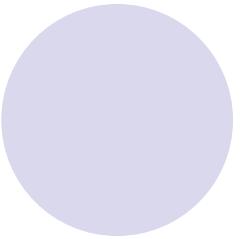
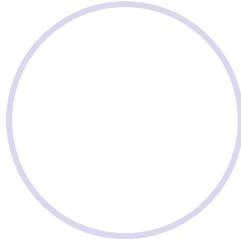
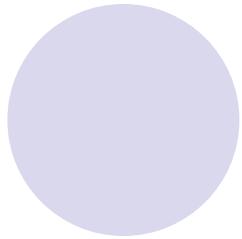
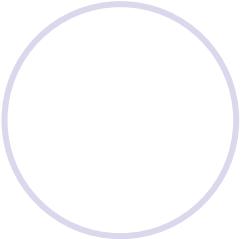
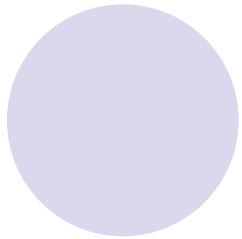
○分货和配货

○送货



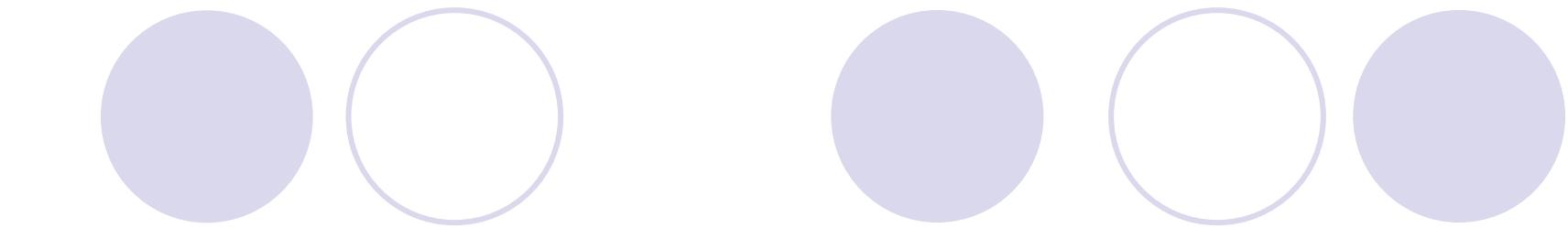
- 物流信息的分类 (按管理层次)

- 操作管理信息
- 战术管理信息
- 战略管理信息

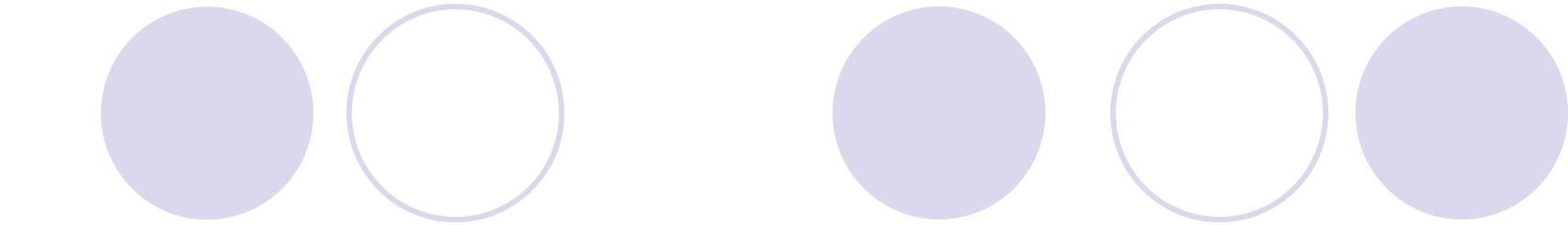


● 物流信息的特点

- 信息量大，分布广
- 动态性强，信息价值衰减快
- 种类多



- 物流信息系统是物流企业针对环境所带来的挑战而作出的基于信息技术的解决方案，它是物流企业按照现代管理思想、理念，以信息技术为支撑，所开发的信息系统。
- 物流信息系统具有集成化、模块化、实时化、网络化和智能化等主要特点。

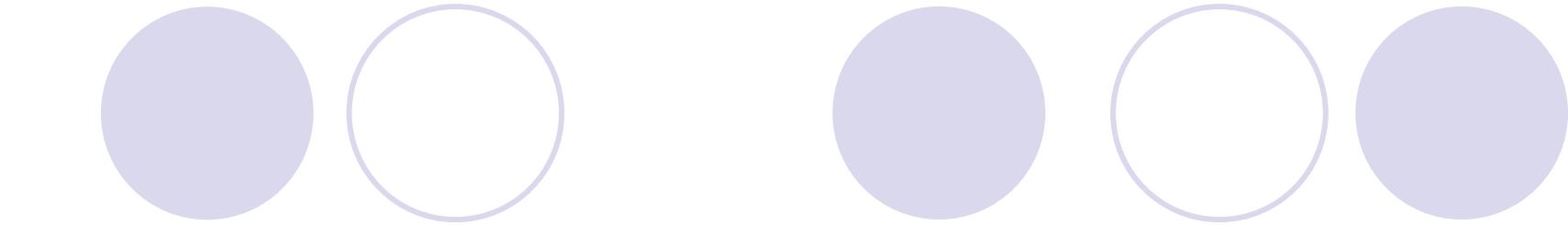


- 物流信息系统的分类

- 按系统功能性质分类：操作型、决策型
- 按系统配置分类：单机系统、网络系统

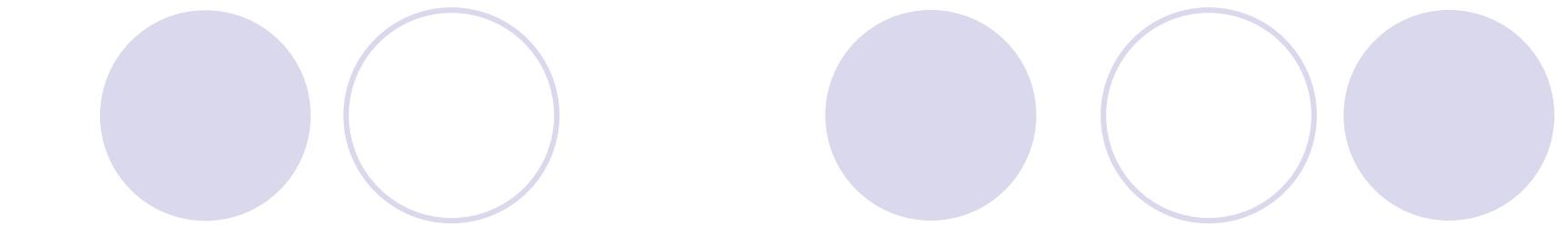
物流系统分析

- 物流系统分析的概念
- 物流系统分析的特点
- 物流系统分析方法



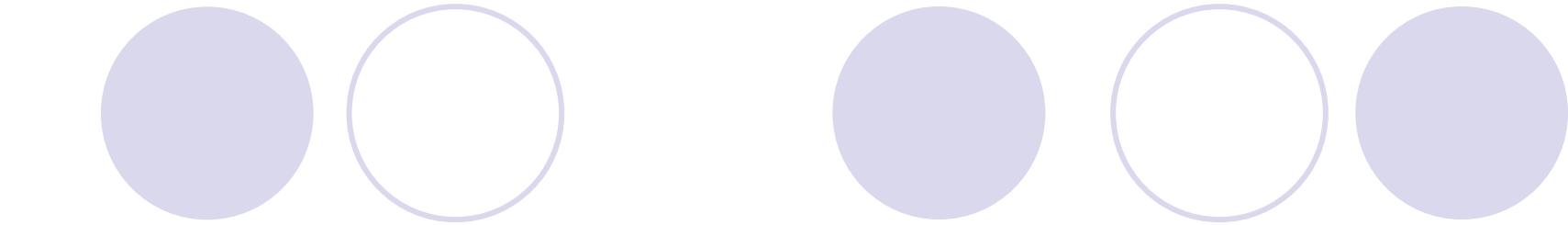
- **物流系统分析**是指在一定时间、空间里，
对其所从事的物流事务和过程作为一个整
体来处理，以系统的观点、系统工程的理
论和方法进行分析研究，以实现其空间和
时间的经济效应。

- 物流系统分析的目的
 - 系统问题→系统分析→最优系统方案



● 物流系统分析的作用

- 系统的建立过程分为系统规划、系统设计和系统实施三个阶段。
- 系统分析起到承上启下的作用，特别是当系统中存在不确定因素或者相互矛盾的因素时，更需要通过系统分析来避免技术上的大量返工和经济上的重大损失。



- 物流系统分析的特点

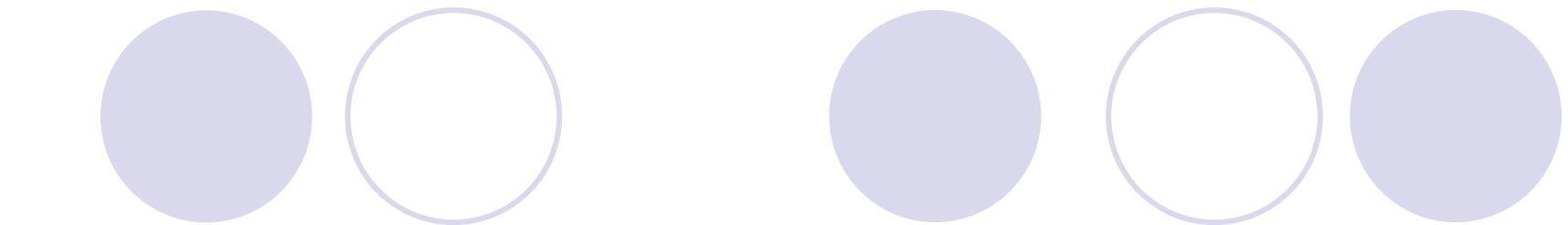
- 以整体为目标
- 以特定问题为对象
- 运用定量方法
- 凭借价值预测

物流系统分析方法

- 物流系统分析的步骤

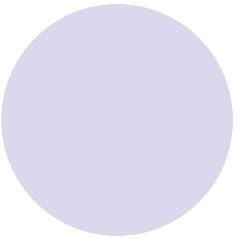
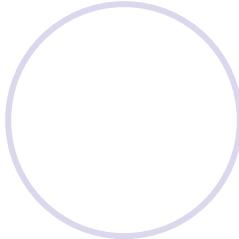
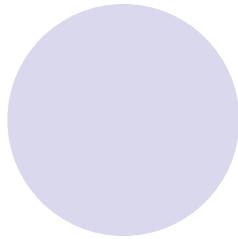
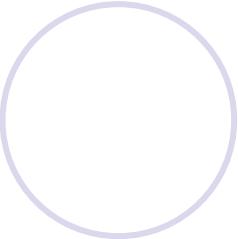
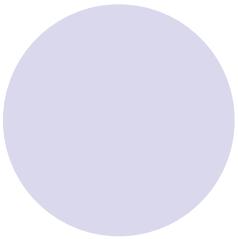
- 物流系统模型化

- 物流系统优化方法



● 物流系统分析的步骤

- 界定问题的范畴
- 确定目标
- 提出方案
- 建立模型
- 系统优化
- 系统评价



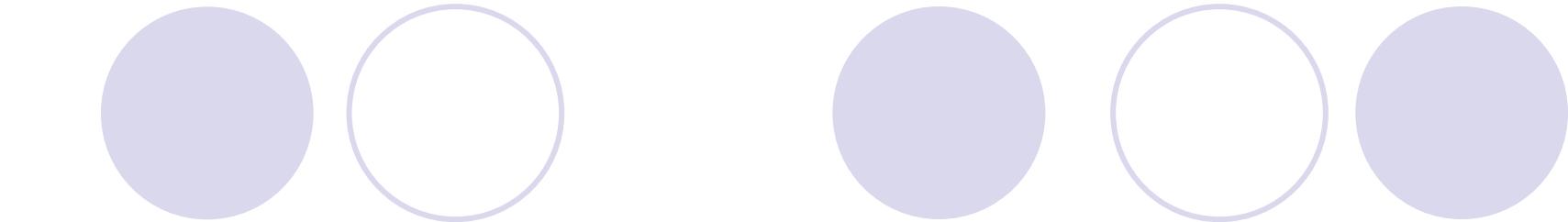
● 物流系统模型化

○ 实物模型

○ 图示模型

○ 模拟模型

○ 数学模型



- 物流系统优化方法

- 规划论方法

- 模拟方法

- 启发式方法：指人在解决问题时所采取的一种根据经验规则进行发现的方法。其特点是在解决问题时，利用过去的经验，选择已经行之有效的方法，而不是系统地、以确定的步骤去寻求答案。

