LEONARDO DA VINCI
Transfer of Innovation

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Managerial Accounting for Decision-making

Leonardo da Vinci programme project

„Development and Approbation of Applied Courses Based on the Transfer of Teaching Innovations in Finance and Management for Further Education of Entrepreneurs and Specialists in Latvia, Lithuania and Bulgaria"

2010

Contents

Course Introduction

Motivation for Developing the Course

Research by the members of the project consortium Employers' Confederation of Latvia and Bulgarian Chamber of Commerce and Industry indicated the need for further education courses.

Innovative Content of the Course

The course is developed to include the following innovative content:

- Key concepts of managerial accounting, which are explained from an applied perspective with case studies and problems emphasizing the input managerial accounting provides to decision makers in the firm;
- Applied exercises, which cover topics such as evaluation of capital investment projects with different investment valuation techniques, preparation of various budgets and estimation of operating costs;
- Summaries are provided at the end of every chapter, which aid revision and control of knowledge acquisition during self-study;

Innovative Teaching Methods of the Course

The course is developed to utilise the following innovative teaching methods:

- Availability on the electronic platform with interactive learning and interactive evaluation methods;
- Active use of case studies and participant centred learning;
- Availability in modular form;
- Utilising two forms of learning - self-study and tutorial consultations;
- Availability in several languages simultaneously.

Target Audience for the Course

The target audience are: entrepreneurs, finance and management specialists from Latvia, Lithuania and Bulgaria and, in the longer term, similar groups in any other European country.
The course assumes little prior applied knowledge in the area of financial and operation analysis.
The course is intended for 32 academic hours (2 credit points).

Course Objective

The objective of the course is to provide entrepreneurs with the knowledge in the area of managerial accounting, in order to enable them to successfully make financial decisions and successfully plan financial and business operations.

After successfully completing this course, the entrepreneurs will gain an understanding of the most accepted systems of managerial accounting and different decision-making technologies, will be able to independently apply cost and inventory valuation methods as well as the calculation method in making decisions about future, to predict future income and costs of the company and to plan budgets.

Description of Course Sections

1. Introduction to management accounting
2. Cost classification and description
3. Prime cost
4. Estimation of full prime cost
5. Estimation of variable prime costs
6. Stock valuation
7. Decisions imposed by limiting factors
8. Cash planning
9. Practical Training Session and Exercises

1. Introduction to management accounting

This section covers:

- The basic objectives of management accounting, the information that managerial accounting considers and the key concepts of the field;
- Comparison between financial and management accounting;
- Decision making processes in the firm and how managerial accounting can affect these decisions;

The questions in this section are mostly of conceptual nature ensuring that the audience is familiar with the vocabulary and concepts that will be used throughout the course.

2. Cost classification and description

This section begins to analyse one of the central topics of the course – costs:

- Costs are classified by function, type and level of management;
- Prime costs calculations are explained, including the calculation of direct, indirect and variable costs. Examples are provided for these concepts.

This question contains multiple choice questions, which aim to ensure competence in the way firm's costs can be decomposed and analysed.

3. Prime Cost

This section covers prime cost with the following subtopics:

- The meaning of prime cost estimates and their decomposition into component parts;

- Prime costs calculations are explained, including the calculation of direct, indirect and variable costs.
- Activity based costing, which is explained with the aid of case studies.

This section also contains questions to ensure that key concepts are understood well.

4. Estimation of Full Prime Cost

This section covers the following topics:

- Absorption costing method and absorption costing of production costs. Examples are provided to explain absorption costing;
- Notional unit costing method.
- Overhead absorption costing.

As in other sections, questions are provided at the end of the section.

5. Estimation of Variable Prime Costs

This section covers the following topics:

- Marginal costing method or the contribution method;
- Comparison of absorption costing and marginal costing methods.

Apart from the questions to aid self-study, this section also includes exercises, which cover topics such as estimation of variable costs per unit, estimating profits or losses using different costing methods, etc.

6. Stock Valuation

This section covers stock valuation and its part in managerial accounting. The topics covered include:

- Different types of storage systems – centralised and decentralised;
- Role of stocks and requirements for accumulation of inventories.
- Stock accounting, valuation and management methods. This includes LIFO, FIFO and weighted average methods;
- The stock management section discusses various approaches – economic order quantity, minimum and maximum level of stocks as well as the Just-In-Time system.

7. Decisions Imposed by Limiting Factors

This section covers decision-making under the circumstances of scarcity and limited resources, including topics such as:

- Decisions over outsourcing certain aspects of production - `make or buy decisions';
- Making decisions under uncertainty – this section covers such methods as optional decision statements, graphical representation of optional decisions, etc. It also provides detailed examples.

The questions part of this section also includes exercises asking the course participants to make business decisions.

8. Cash Planning

This section covers one of the most important topics for small and medium enterprises – cash flow management. The topics covered include:

- Cash budget and cash flow forecasts;
- The concept of cash flow, cash flow planning and separating cash flows by individual business activities.
- Cash flow management – including stages of cash flow management and detailed examples.
- Deviations from the budgeted cash flow;
- Cash flow statements and various presentation methods including discussion of accounting standards.

This section also includes multiple choice questions among others testing comprehension of the material.

9. Practical Training Session and Exercises

This section includes eleven applied exercises covering topics of the entirety of the course, from preparing cost estimates to functional budget plans and cash budget preparation.

Evaluation Methods

As has been mentioned before, every chapter of the course contains opportunities to test the knowledge of the audience, which are in the form of questions and more involved problems. The types of question include open ended questions as well as multiple choice questions. The problems usually involve calculations and asking the student to fill in details of what internal accounting documents might look like.

Summary of the Course and Evaluation Methods

The course provides the target audience with a broad knowledge on the key topics of managerial accounting and its application in an enterprise.

The focus is on practical application of knowledge – entrepreneurs and finance specialists using the course and questions of the course to assess the situation in their own company.

The course can be combined with other further professional education courses developed in the project.

1. Introduction to management accounting

1.1. The concept, objectives, tasks, areas of concern, basic methods and basic principles of management accounting

Management accounting – a system of recording and analysis of business information with the purpose of decision making, calculation of the prime cost estimates, planning and control to ensure high performance of business management functions.

This system comprises the information identification and generation, presentation, analysis and interpretation processes necessary to assist the enterprise management with efficient performance of business activities.

Information can be considered to be any data, facts, observations etc. that extends scope of our knowledge and gives the explanation to different phenomena.

Operational information provides with the basic data for the establishment of information base for management accounting. The management is often not interested in the raw operational data – it usually needs a summary and analysis of data in the relevant format the preparation of which is the work of enterprise management accounting service (if such service exists, of course).

In practice management information often contains some ***commercial secret elements*** (for example, the prime cost of products; its component cost elements; expenses of a project etc.), therefore the main users of this information ***the internal users***.

- enterprise management;
- owners;
- employees.

If necessary the operational information is available not only to internal users (for example, enterprise management, shareholders), but also the external – certified auditors, bank officials, business partners, financial advisors etc. individuals (i.e., external users).

The management accounting system and the applied methodology (techniques of cost apportionment, methods of analysis) are in accordance with the enterprise needs and business specifics chosen by the enterprise manager.

Manager is in the capacity to choose any method that he/she deems to be useful. No strict and irreversible rules exist for management accounting and financial decision making. Managers can use those techniques that he/she believes to be the most suitable for every occasion. The methodology used is adapted to suit the specific needs of an enterprise.

As it can be derived from the management accounting definition, ***the main component parts of management accounting*** are as follows:

1. ***Cost accounting and the prime cost calculations***

What is the cost of goods sold, produced or services provided and what is their prime cost?

This information is required in the process of preparing the profit or loss account and valuation of the stock of goods and unfinished products as well as for pricing.

There are two main alternative systems for the prime cost calculation: calculation of the full production prime cost and the variable cost calculation.

2. ***Decision making***

Managers have to take a lot of decisions, for example:

- What needs to be produced?
- What should be the financing model of the enterprise?
- Whether the project will be cost-effective?

3. ***Planning and control***

Planning is the process of setting goals and the future cost and revenue estimates necessary for the preparation of the budget plan. This also helps to identify the procurement and output requirement in the enterprise.

When the objectives are set and the budget plan has been prepared, it can be used for performance control as a guideline (measure) for the detection and evaluation of any business failure.

Finally the performance of the employees and the organisational units can be assessed by comparing it with the plan.

These accounting processes are often interrelated and complement each other: for example, both for decision-taking and for the preparation of budgets operational cost accounting data are required.

The above components relate to the respective ***basic objectives*** of management accounting:

- cost accounting of the enterprise products or services and the calculation of their prime cost;
- provision of the enterprise management with the information required for their decision-taking;
- planning and control of enterprise business.

Pursuant to these goals the following ***tasks*** have to be performed:

- cost accounting;
- prime cost calculation;
- setting of selling prices;
- valuation of production stocks;
- budget planning and control;
- adjustment of operations.

The objects of concern of management accounting are as follows:

- types of enterprise business activities;
- goods produced and services provided in the enterprise;
- organisational units;
- responsibility centres.

Basic methods, applied in the management accounting process:

- analytical method;
- economic–mathematical method;
- statistic method.

The following ***basic principles*** need to be complied with in management accounting:
- objectivity;
- relevance to the set goals;
- simplicity;
- motivation.

Objectivity Management information data must objectively reflected the enterprise performance data and justify the budgeted figures in order to ensure the right decision-taking.
Relevance to the set goals Areas of business, budgeted figures must correspond to the basic goals of the enterprise instead of satisfying the interests of certain individuals.
Simplicity The methods applied in management accounting must be clear both to the enterprise managers and the directors of the functional departments so that managers of all levels could act appropriately in the process of decision-taking.
Motivation The developed plans must motivate the enterprise managers and employees to promote the achievement of the goals set.

1.2. Comparison of management accounts and financial accounts

In contemporary conditions of free market economy business management aimed at a constant advancement towards certain enterprise performance results allows to tackle complex tasks across 2 levels of accounting associated with an efficient use of resources. Consistent with the above the system of accounting records is designed.

The first level of accounting is based on the information regarding the facts that have already taken place in business activities and is related to financial accounting which provides for the following:
- presentation of expenses and costs;
- presentation of business results.

Within this level the information is provided to the following external users:
- government authorities;
- banks;
- other users of information.

The second level of accounting is related to management accounts which are focussing on a shorter- or longer-term future by thus assisting the business managers – the internal information users in their decision-taking, planning and control and adjustment of different business processes.

Many elements of financial accounting are also a part of management accounts. Both financial and management accounting is based on the data of operational accounting which need to be accurate, fair and easily available in order to ensure taking the right decisions.

Financial accounting comprises the information intended for both internal and external users and its the basic requirements for its presentation is laid down in the relevant laws and regulations of LR.

Management accounting comprises all types of information necessary for the management of an enterprise. The management of the enterprise defines the necessity and operation of this area of accounting. ***Operational accounting*** is often referred to as a subdivision of management accounting which means accounting for production costs,

calculation of the prime cost and the analysis of production cost economy or absorption (i.e., the budgeted and actual cost variance analysis).

Financial management generally performs recording of past transactions and events and is used to largely for external reporting needs. It deals with the following:

- presentation of enterprise transactions in accordance with the accepted conceptions and principles;
- preparing of reports on business results consistent with the provisions of the law and accounting standards.

Management accounting is rather focussing on the future instead of past transactions. It fulfils the following tasks:

- preparation of the internal reports and designing of management decisions;
- assessment of the costs of transactions, departments, goods produced, services, processes, labour, orders or other enterprise activities;
- analysis of the information generated from the calculation of the prime cost and use of this information in line with the techniques defined by the enterprise management for decision-making, planning and control.

Thus the differences in financial accounting and management accounting can be displayed as follows:

Table 1.1 Differences between the financial and management types of accounts

Financial accounts	Management accounts
Statutory reporting requirements.	What is the prime cost?
Recording and presentation of complete transactions as in a structured manner.	What would the prime cost be if…? What is the profit made on the individual types of activities, products or services? What would the profit be if…?
Focuses on the past events.	Rather focuses on further instead of reflecting past events.
Intended to a large extent for external information users.	Intended only for internal reporting and preparation of management decisions.

Summarized differences and common features between financial and management accounts are described in the following table:

Table 1.2 Comparison of financial and management accounts

Measures / Type of accounts	Financial accounts	Management accounts
1. Main users of reports	external	internal
2. Refers to the time period	past, present	present, future
3. Scope of information	financial data referring to the enterprise as a whole	data referring to enterprise or to individual units
4. Units of accounting	monetary units (Ls)	both physical and monetary units
5. The main purpose	presentation of the true and	presentation of information for

	fair situation	management decision-taking, planning and control
6. Regulation, auditing	regulated by the law and the standards, audited by the state authorities and the elected auditors	not subjected to regulation in Latvia, control performed by the management representatives
7. Charge for the accuracy of accounting	enterprise manager is in charge	Relative accuracy of accounts, management accounting service employees can be in charge
8. Information criteria	objective information, complete information is presented which can be valued in monetary units	relatively correct and easily perceivable, only the necessary information is presented
9. Frequency of reporting	at least once a year	each month or more frequently (on a weekly, daily or even hourly basis)

From the data in Table 1.2 it can be seen that management accounts is a much more operational type of accounting directly oriented on the business interests.

Regardless of the considerably high amount of differences both accounting systems have some features in common which is dictated by the following basic factors:

1. Management accounts are prepared on the basis of objective information (often the information from financial accounts is used), as management decisions cannot be based solely on approximate, subjective information and forecasts.
2. The data of both financial and management accounts are used in decision-making (for example, the financial accounting information assists the investors in taking decisions on the possibilities for cooperation).
3. Operational information is used in both generating the financial reports and the needs of management accounting. The methods of recording the raw data must therefore be the same (for example, the methods for stock accounting, methods of fixed asset depreciation estimates etc.). This is necessary in order to avoid the duplication of recording the raw data.

1.3. Types of information in management accounting

It is possible to divide all types of information into ***accounting and non-accounting information***.

The sources of ***accounting information*** may include:

- financial accounts and reports;
- statistical accounts and reports;
- operational accounts.

1. In order for the costs of information acquisition to not exceed the expected benefits from the use of this information, in management accounts the part of financial accounting information is used that constitutes the most accurate source of information for the purposes of management accounting. If necessary the management accounting

service also uses the reports or statements prepared by the financial accounts department (for example, the balance sheet data in the calculation of variances from the budgeted balance sheet data etc.).

2. If an enterprise is to provide reports to the statistics office often additional accounts have to be prepared with the breakdown by individual accounting objects. It is useful to combine this sort of accounting with the acquisition of information required for the preparation of management accounts.

3. Operational accounting is organised by individual departments, production units, teams etc. This information is comparatively easy to gather with a great role in management accounting. Such information may be, for example, regarding the sales of goods and the daily revenue amounts (from sales of goods) which can facilitate the adoption of operational decisions.

The ***non-accounting sources*** of management accounting information refer to the following:

- internal and external auditing data;
- laboratory and sanitary inspection data;
- opinions by experts from different services, technical estimates (technical data);
- publicly available information (newspapers, magazines, information available via internet, Enterprise Register data etc.);
- opinion provided by the external advisors;
- other information (for example, the credit terms issued by a commercial bank, tender regulations announced by an enterprise etc.).

Non-accounting information may often be qualitative (non-measurable in numbers) in character; the analysis of this information, however, often plays a great role in management accounting, particularly in decision-making, as it helps to predict the probable future events. For example, if there are plans under way for an efficient business partnership with an enterprise of another country, this decision can be considerably affected by an unfavourable political situation in the respective country, any forecasts about the probable deterioration of the economic situation etc.

1.4. Cost accounting and the prime cost calculations

It is important for enterprise managers to know their business costs and the prime cost of goods sold. This allows identify the profitability of enterprise activities and the different types of goods (their earning capacity) as well as to compare the actual costs with the budget within the framework of a cost control system. In order to provide the enterprise management with the information required for these purposes the relevant accounting records must be available.

As management accounting and financial accounting serves different purposes they are often arranged into two different accounting systems. It is always possible to maintain the integrated (single) accounting system which includes both the management and the financial accounting information.

If the enterprise did not have the system for cost accounting and the calculation of the prime cost, the management would not have sufficient information about the following:

- the profitability the individual units of production, services provided or works performed (the earning capacity);
- the earning capacity of the different enterprise departments or operations;

- the dynamics of the different costs of enterprise without which no accurate cost planning is possible;
- the variances between the actual and the budgeted results;
- setting of selling prices in such a manner that they would not only cover the costs but also provide with an acceptable margin of profit;
- the effect laid on the profit margin by any increases or decreases in output volume or closing-down of any production lines or units.

The system of cost accounting and calculation of the prime cost and the information generated by the management accounting may differ on an enterprise by enterprise basis due to the following:

- the enterprises differ by size and structure as well as by their activities, type of products or services;
- the structure of management may be different. Pursuant to the organisational structure, in enterprises with a higher degree of de-centralisation the need for management accounting generated information to managers with lower authority is much larger than in centralised enterprises.

Therefore the main object of accounting in management accounts is the costs which are grouped and accounted for by type, points of cost incurrence, cost units and responsibility centres.

Points of cost incurrence are enterprise units where the consumption of the production resources is initiated (workplaces, teams, production units etc.).

Cost units refer to the types of products manufactured (also works performed and services provided) that are intended for sale in the market. In the management accounting system it is required to distinguish between such objects of accounting as ***responsibility centres*** (enterprise departments where the managers are directly responsible for the cost-effectiveness of the expenses incurred).

1.5. Decision making

Decisions have to be made in order to meet the targets.
Decision is the choice of the optimal alternative model of action.
Decision making is a process required for the execution of any business related function.
Accountants in management accounting are mainly responsible for the provision of information to managers to assist them in making of the following decisions:

- enterprise policy writing;
- enterprise business planning and control;
- alternative areas of business activity;
- reporting to external users of reports (shareholders etc.);
- reporting to the employees;
- asset management.

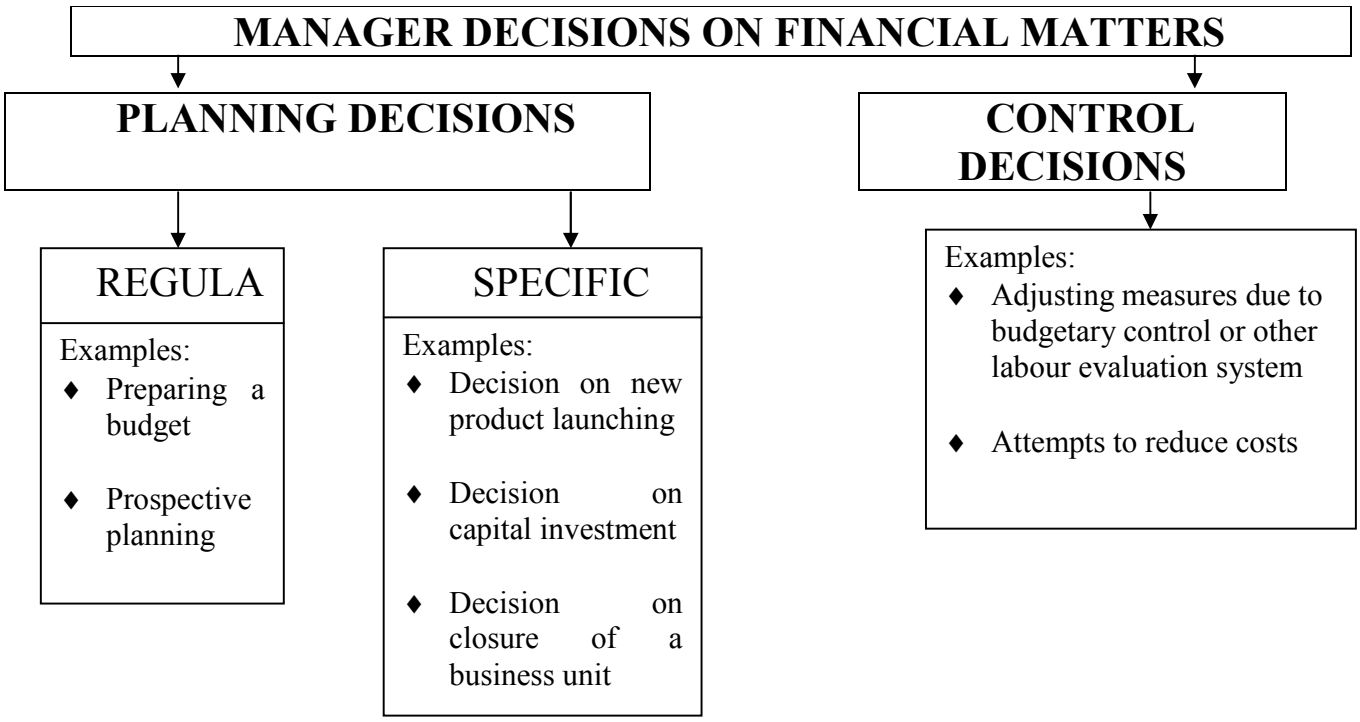
This activity ensures the following:

- long-term planning;
- development of short-term plans;
- financial accounting and cost accounting;
- financial control (adjustments of operations for improvement of further activities);
- provision and control of cash resources;

- auditing of different systems and timely notification of the results.

The quality of decision making depends on the quality of the financial information intended for various levels of managers. Along with the growth of the enterprise in size and the increasing complexity level mangers need more and more information and with a higher level of detail. Without information it is not possible for the managers to lead the enterprise in the desirable direction.

Chart 1. Types of financial decisions



In order to take a decision on financial matters managers need lots of different information for forecasting; preparation of budget plans; about plans and objectives; on the actual results and their comparison with the plan or objective.

These different types of information provide the grounds for financial planning and control as well as allow taking of knowledge-based decisions regarding the enterprise future, production, services, departments etc.

Decisions in business are taken in groups of employees – **collective decisions**, or as a result of the input provided by individual employees – **individual decisions**. The choice of the individual or collective decision taking method depends on the particular situation when both the type of decision and the efficiency of the decision making process need to be taken into consideration. The ability of the manager to take optimal decisions defines his/her capacity to perform managerial functions, as the decisions taken serve as the main factor for guiding and organising the performance of the manager, while the quality of the decisions taken describes the performance results.

Decisions related to enterprises management are subdivided into 2 basic groups:

- predictable (standard);

- unpredictable (non-standard).

Predictable (programmable) decisions are used when a problem repeats itself several times, and therefore the manager tries to resolve it according to a pre-established scenario based on earlier experiences. These decisions come across to managers on a daily basis, for example, when setting the payment terms for the employees, in costs calculation, identifying the prime cost of products and the selling prices according to pre-defined standards.

When addressing new, extraordinary issues, **unpredictable (non-programmable) decisions** are used, for example, when arranging for the production and distribution of new products. Experience, excellent intuition and creativity are needed for taking such decisions.

Depending on the scope of application and timing decisions are subdivided into:

- strategic-level decisions;
- operational-level decisions.

Strategic-level decisions apply to the enterprise business operations as a whole. These are long-term decisions that determine how successful the activities of an enterprise will be, if it will survive the competition or fail.

Operational-level decisions are short-term decisions referring to certain management functions inside the enterprise over a certain period of time. For example, whether in the result of the raw material price increase the selling price of product A should be raised or maintained at the same level.

Decisions are taken regarding the risk in varying conditions that are classified as:

- definite conditions;
- risk conditions;
- indefinite conditions.

Definite conditions – if the manager exactly defines the outcome that will be achieved in the result of implementing each of the alternative options. Therefore only one of the options is the optimal.

Risk conditions – if the results of implementing a decision cannot be defined with certain accuracy, while the probability of each possible outcome can be defined. Probability describes the degree of possibility that the result will be as expected and it is measured in the range of values from 0 to 1. The sum of all alternative probabilities should equal 1.

Indefinite conditions – if the probability of expected outcome cannot be defined. Usually these conditions set in if the factors affecting the outcome are new and complicated enough that it is impossible to acquire the information about them with a reasonable degree of certainty. This is present in circumstances that are changing fast. The highest degree of uncertainty is characteristic of the social, cultural, political and scientific environment.

Table 1.3 Description of the types of decisions

Types of decisions	Description
1. Decisions related with planning of business activities	Decisions associated with the optimal: choice for usage of resources; definition of product types and quantities; resolving of other concerns related to planning

2. Decisions related with control of business activities	Decisions related to further actions: whether excessively high costs should be reduced or not; how to reduce these costs
3. Decisions on short-time concerns	Short-term concerns are continuously present in the course of business and refer to different areas of business activities: whether an order should be taken up or not; whether a new business activity should be introduced or not; whether the selling prices should be increased or not
4. Decisions related with investing of capital	These decisions are usually related to the assessment of several alternative mutually exclusive options in consideration of limited resources and the different outcomes produced by each of the options

The following factors have to be considered in decision making:

- employees and their skills, experience, competencies and the impact of the decision laid on their motivation and work efficiency;
- suppliers – whether the supplier can be trusted to deliver the material values in the required amount, quality and time;
- consumers – whether the decision made will affect the product quality, price etc. and whether these qualities will meet the consumer needs;
- timing - whether a decision should be taken now or at some point in future; whether a decision taken at present can be changed in future;
- possibilities of execution – whether the decision taken can be carried out technically;
- flexibility – whether the decision taken allows to respond flexibly to future events.

1.6. Financial planning and control

In the process of business planning managers choose the types and areas of activity that need to be implemented in a shorter or longer term in the future. The process of implementation of the plans developed need to be tracked, controlled, verified and the managers need to respond to unexpected events and therefore change the plans, adjust them to the new circumstances.

Planning, including:

- the setting of enterprise goals;
- the development of future areas of activity;
- the drafting of budgets;
- assessment of the planned operating efficiency.

Control and adjustment, including:

- comparison of the actual results, reference and budgeted figures;
- identification of mistakes and failures and assessment of possibilities for improvement of operations.

In fact, financial planning and control means:

- making money;
- saving money;
- spending money;
- investing money;
- increasing the capital.

1.6. Summary

- ***Management accounting*** is a system of recording and analysis of operational information with the purpose of decision making, calculation of the prime cost estimates, planning and control to ensure the execution of enterprise management functions.
- The main components of management accounting are as follows: ***cost accounting and the prime cost calculations, decision making, planning and control***.
- Management accounting focuses mainly on future events, its information is solely for the use by internal users; accounting information is not always objective, however, highly useful to the enterprise management by assisting them with business decision making, operation planning etc.
- Management accounting uses data from the financial accounts, the internal accounting data as well as non-accounting information serving as a basis for prime cost calculations (the role of price calculation or even process costing should be mentioned here), for prospective planning and taking of business-related (rational) decisions.
- There are three main areas of cost and management accounting:
  - ***Cost accounting and the prime cost calculations***
    Presentation of costs and calculation of prime cost for goods, services, activities etc.
  - ***Decision making***
    Acquisition of financial information in order to assist in taking of regular decisions (for example, prospective planning) as well as of specific decisions (for example, on usage of capital).
  - ***Planning and control***
    Generation of information on the costs for the purpose of preparing the budget, business evaluation and control, including the control of the budget plan, variance analysis and the responsibility centre analysis etc.

1.7. Questions

1. Describe the following in respect to management accounting:
   - concept;
   - goals;
   - objectives;
   - objects of concern;
   - basic methods;
   - basic principles.
2. Compare financial accounts and management accounts, and state the differences.
3. Describe the types of information in management accounting.

4. What is cost accounting and the prime cost calculation.
5. Describe the decision making process.
6. Name the types of decisions.
7. Describe the process of budget planning and control.
8. Tasks of management accounting:
    - preparing of budgets;
    - cost and budget control;
    - preparation of annual accounts;
    - performing the stock-take of an enterprise.
9. Management accounting data:
    - available to all interested parties;
    - constitute the commercial secret of an enterprise;
    - concerned with operating plans;
    - representation of a past event.

2. Cost classification and description

2.1. Types of costs

Costs are the consumption of resources for the purpose of carrying out business activities, manufacturing and sale of products or provision of services expressed in cash.

In business activities it is important to distinguish between:

- business *costs of a certain calendar period* (month, quarter, year) in order to assess what costs have been incurred, including by their type and the point of cost incurrence;
- *the prime cost of a product or service* in order to determine to what they relate.

Current and historic costs

Current costs are expenditure that is incurred but have neither been realised yet nor generated any revenue.

This expenditure is recorded in the asset side of balance sheet as values that have been paid for, but that haven't been yet written off. These requirements are as follows:

- fixed assets;
- stock of goods for sale;
- raw materials;
- unfinished products etc.

Historic costs are costs incurred in the previous accounting period, but have been realised and have generated revenues, and cannot generate any more revenues. These costs are presented in the income statement. These are as follows:

- the prime cost of goods sold;
- administration, selling expenses etc.

Product costs and period costs

Production costs and non-production costs

Product costs are costs that are attributable to the prime cost of a product. If the product is not sold these costs are presented under the balance sheet item of stock of goods for sale. As soon as this product unit is sold the costs are presented under ***production costs*** of goods sold in the income statement.

Period costs are attributable to the period of time when they are incurred and are not included in the prime cost of the product as they can't be 'stored' in the warehouse.

Non-production costs are usually believed to be period costs, but this division may also be different.

Non-production costs are administration costs including administration salaries and social insurance fees, office maintenance and technological equipment costs etc. as well as the selling expenses including salaries to sales agents, transport expenses etc.

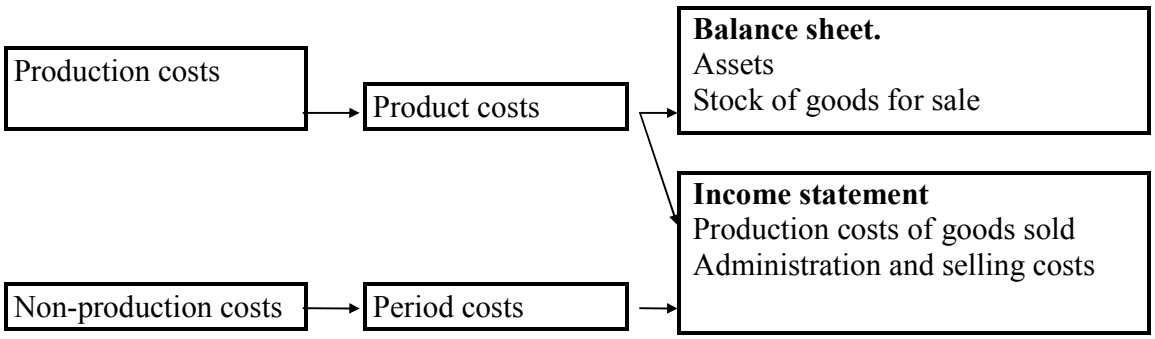


Figure 2.1 Correlation between *production and non-production* and *product and period* costs

Exercise 1

Enterprise produces only one type of products. The output is 1,000 units per period. The following costs have been incurred:

Production costs	Ls	Ls
Costs of materials	400	
Direct labour costs	200	
Production overheads	300	900
Non-production costs		300
Total:		1200

During the period 600 units have been sold and Ls 1,000 of revenue has been made. At the beginning of period there was no stock of goods for sale.

Calculate the amount of profit and the value of the stock of goods for sale.

Solution:

	Ls
Turnover (sales revenue)	1000
Production cost of goods sold	540
Gross profit	460
Non-production costs	300
Profit	160

The value of the stock of goods for sale is as follows: 400x0.9=360

Direct and indirect costs

Direct costs are costs that can be attributed in full to the object of cost calculation.

Cost calculation object is a measurement unit of a product, service or activity for which the prime cost is calculated. Dependent on the type of business an object of cost calculation can be a group of similar products (a batch), a contract or an order as well as an operation, process etc.

- Direct material costs are the costs of materials used directly in the production and sale of goods (or provision of services).
- Direct labour costs are the labour costs of the personnel employed directly in the production of goods or provision of services.
- Other direct costs are costs that can be fully related to the production of certain goods, the provision of services or the work of a certain structural unit.

Indirect costs are costs that are incurred in the course of making a product, providing a service, work of a structural unit or in the course of carrying out a certain activity, but which cannot be related directly and in full to a certain cost object. Indirect costs are apportioned in a mediated manner to the prime cost by dividing them proportionally according to a simple measure of apportionment and it would be best if this division corresponded most precisely to the causes of cost incurrence.

Examples of indirect (overhead) costs are as follows:

- indirect material costs (lubricants, materials used in cooling and washing, depreciation of machinery, energy costs (in power generating aggregates, consumption of technological steam or fuel in production machinery));
- indirect labour costs (salaries and social insurance payments for production managers);
- other indirect costs (insurance of buildings, depreciation of production buildings).

The following elements constitute the overall prime cost of the cost objects:

Direct material costs	+	Indirect material costs	=	Total material costs
+		+		
Direct labour costs	+	Indirect labour costs	=	Total labour costs
+		+		
Other direct costs	+	Other indirect costs	=	Other costs in total
Prime costs	+	**Overhead costs**	=	**Total costs**

Point of cost incurrence is a specific department, area of responsibility, equipment and other objects or groups of objects where the costs attributable to a specified cost objects are collected. The distinction can be made between the following points of cost incurrence in a production enterprise:

- production facilities (production output units; machinery item, groups of machinery items, working teams etc.);
- auxiliary production units that are required for ensuring the production process;
- departments dealing with the promotion of products (services);
- enterprise administration.

Production, administration and selling costs

Costs in the system of the prime cost calculation of a conventional production enterprise are classified in the following way:

Production costs: costs incurred by the sequence of operations beginning with the supply of raw materials, their processing and ending with the completion of the product.

Administration costs: costs of managing the enterprise, for example, planning and controlling its operations etc. costs insofar as such costs are not related to the production or sales of products.

Selling costs: selling, advertising, marketing as well as storage and distribution costs.

Storage and distribution costs: costs incurred by the sequence of operations beginning with the receipt of finished goods from the production department and ending with their despatch.

Many cost items cannot be easily attributed to one or to the other of these items of calculation.

Other expenses that do not fully correspond to any of these items could be classified as 'overhead costs' or according to their identity (i.e., enterprise research and development costs).

In order to calculate the prime cost of goods produced and sold, enterprises use the prime cost calculation scheme.

The prime cost calculation scheme:

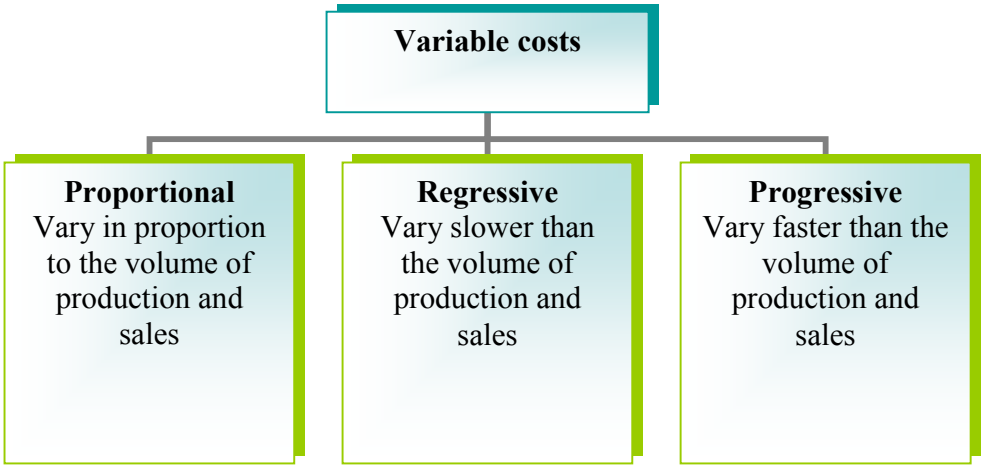
	Ls
Direct material costs	*A*
Direct labour costs	B
Other direct costs	C
Prime costs	**A+B+C**
Production overheads	D
Full production prime cost	**A+B+C+D**
Administration overhead	E
Selling, storage and distribution costs	F
Total costs (full prime cost)	**A+B+C+D+E+F**

Variable and fixed costs (see also paragraph 2.3.3)

Variable costs are costs the total amount of which rises as the volume of activity increases. It is also generally accepted that the variable costs per unit remain a constant value across the entire volume of activity.

Variable costs are the direct material costs and the direct labour costs if employees are paid for direct labour instead of the time spent in the workplace. Besides, a share of overheads varies proportionally to the production volume – power consumption in machinery, consumption of technological thermal power etc. Also the non-production costs may be classified as variable costs – commission fees to sales agents that vary in proportion to the sales volume.

Figure 2.2 Types of variable costs



Fixed costs are conditionally permanent costs and are unaffected by changes in the level of activity within certain limits.
Examples of such costs are salaries to the management, heating and lighting costs, depreciation etc.

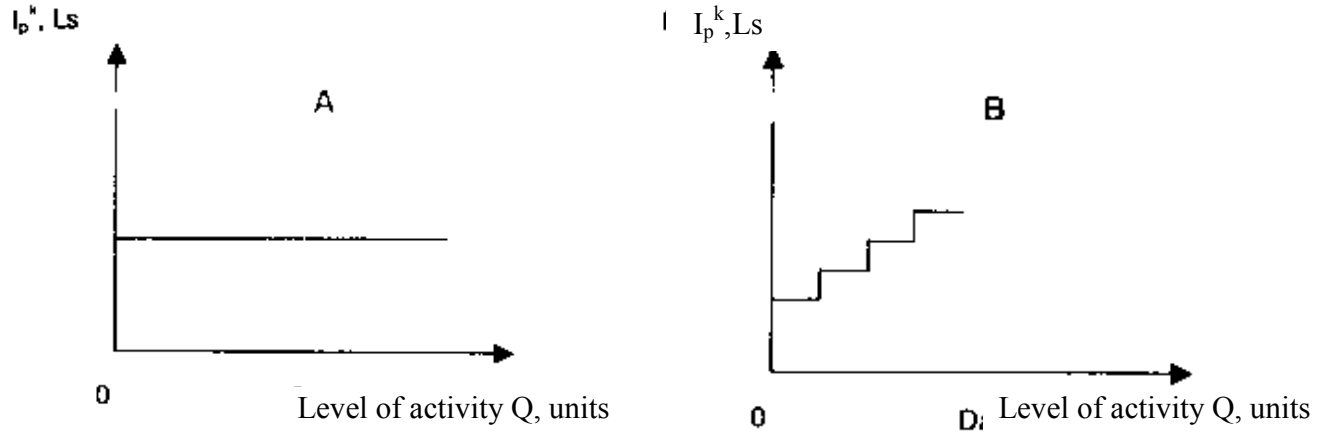
Depending on how the individual cost groups are affected by changes in the level of business activity, the costs are divided as follows:

- permanent (fixed, constant) costs;
- variable costs.

Permanent costs (I_p^k) are enterprise costs that do not vary within certain limits by changes in the level of its activities.

There isn't always a linear correlation between the amount of costs and the level of business activity as shown in Figure 2.3. In Diagram A. A share of the costs varies step by step (see 2.3. Diagram B of Figure 2.3).

Figure 2.3 Permanent costs during a certain calendar time unit (I_p^k)



Example 2.1 Rent payments for the premises intended as a workshop for car repairs. 2 cars can be repaired at the same time in the premises rented. Given the amount of work the rent payments is unchangeable. If we want to take up the repairs of the third car additional room space will be required and the costs of rent will increase. Other costs related with the maintenance of these premises will increase as well, for example, power for lighting etc. costs.

The total amount of fixed costs either does not change or the changes must take slower than changes in the volume of activity. At the same time these costs when re-calculated per unit of products manufactured (I_p^v), are reduced in a non-linear way upon increase in the level of activity.

Example 2.2 Raw materials are processed by using an item of machinery the depreciation of which is Ls 3,000 per year.

Table 2.1 Estimate of fixed costs

Volume of output in units	Fixed costs, Ls	
	Total	Per 1 unit
0	3000,00	0
100	3000,00	30,00
200	3000,00	15,00
300	3000,00	10,00

All costs can be generally classified as fixed or variable costs. Therefore:

TOTAL COSTS= FIXED COSTS+VARIABLE COSTS

In management accounting it is generally accepted to describe the dynamics of costs by a straight line (the linear assumption of costs) because of the following reasons:

- it can be easier to understand than describing the dynamics by a curve;
- the fixed and variable costs are easier to calculate and use;

- the linear assumption of costs in practice is used only upon normal levels of output, i.e., within the limits of 'a normal volume of activity';
- within the limits of this volume of activity the cost calculations of a management accountant and of a financial accountant could not differ considerably (if there are any differences at all); therefore the linear assumption of costs should be used as sufficient accuracy is achieved by lower labour consumption and lower costs;
- these are only simplified assumptions regarding the actual cost dynamics. In this way, however, a highly probable information can be acquired about the fixed and the variable costs.

Figure 2.3 Changes in the variable and fixed costs by varying levels of activity

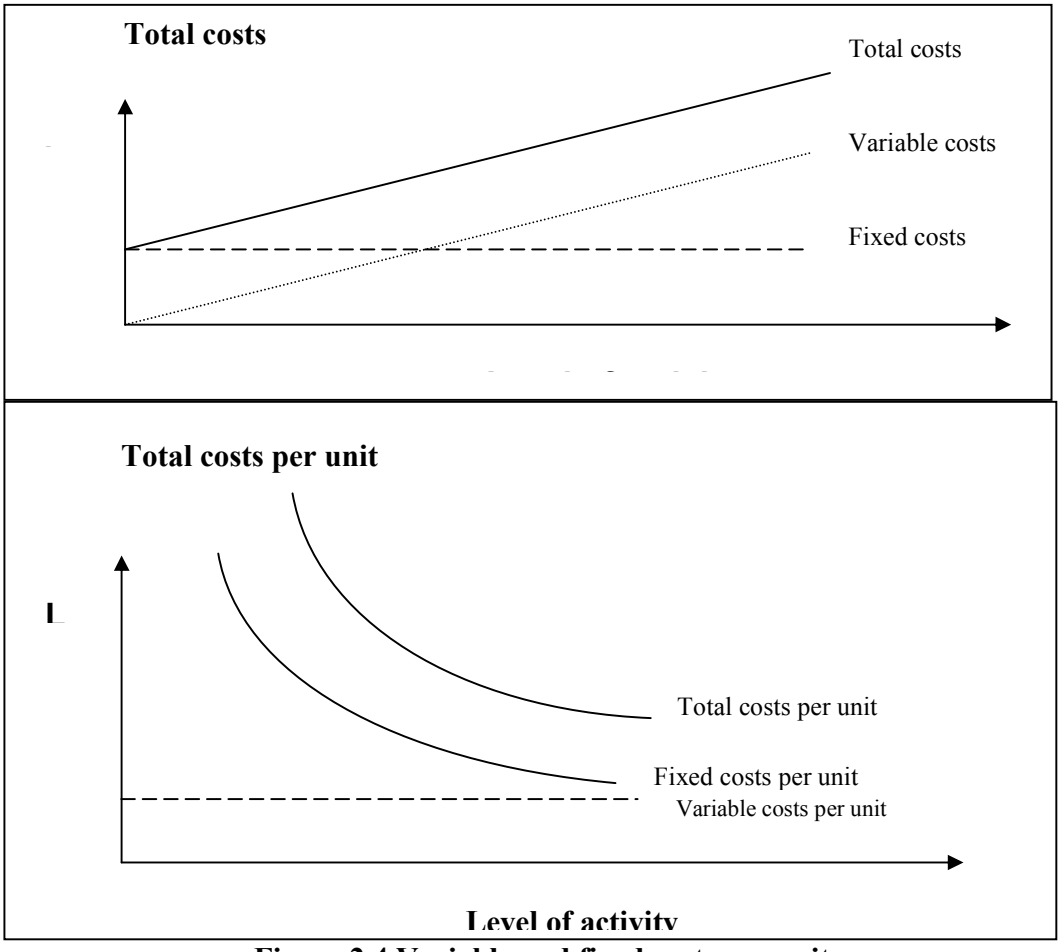
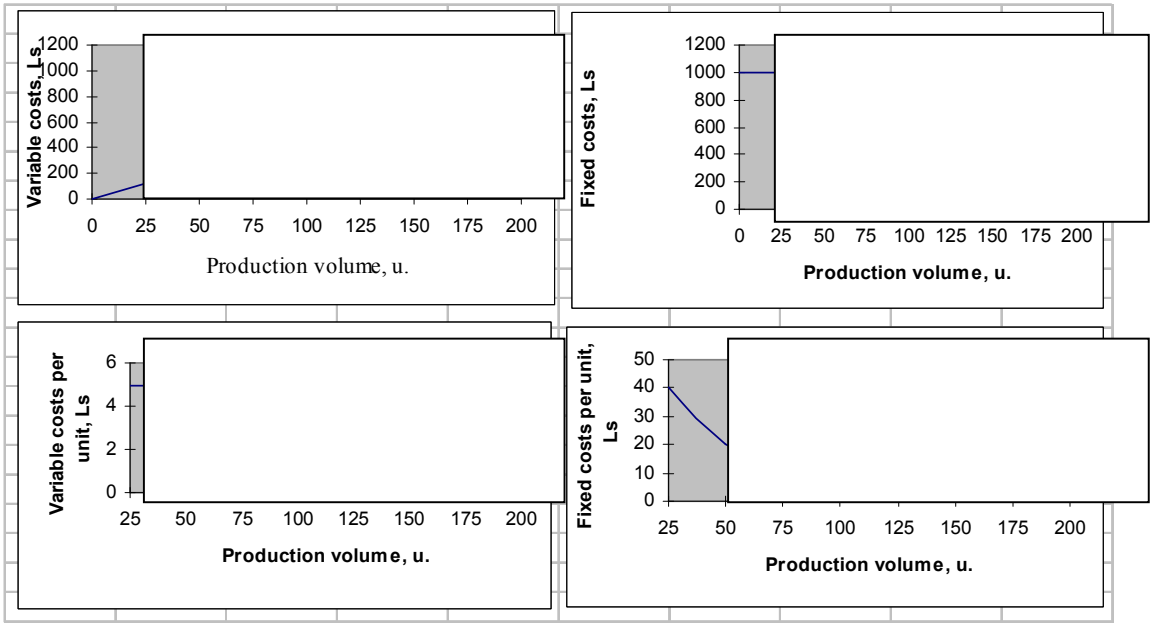


Figure 2.4 Variable and fixed costs per unit

Exercise 2 Variable costs constitute Ls 6 per unit, variable costs are Ls 1,000 per period. Maximum volume of output is 200 units per period.

Represent in a graphical format, how the variable and the fixed costs change depending on the volume of production and how these costs change per unit of production depending on the volume of activity.



Exercise 3 **Fixed and variable costs**

The following costs are budgeted by a road transportation enterprise:

Fixed costs (per month)	Ls 45,000
Variable costs (per ton-kilometre)	Ls 0.50
Monthly budget	
Number of trucks	18
Total number of trips	510
Average length of a trip	120 km
Average weight of cargo per trip	5 tons

What is the budgeted amount of total costs?

Solution

Budgeted amount of ton-kilometres	306 000	120x510x5
Fixed costs	45 000	as given above
Variable costs	153 000	306,000x0.5
Total costs	198 000	153,000+45,000

Exercise 4

There are six trucks owned by the road transportation enterprise. The book value of one truck is Ls 14,000. Other information required for the budget planning is as follows:

Each driver will receive the basic salary of Ls 8,500 per year. It is expected that the salary for overtime will be 10% from the basic salary.
The enterprise has defined that the depreciation rate of trucks is 25% per annum; depreciation charges are calculated according to the straight line method.
It is expected that each truck will cover 44,000 km during the planning period.
The annual vehicle fee of constitutes Ls 2,500 per truck, insurance of each truck per year – Ls 1,000.
The average fuel consumption is 1 litre per 10 km, the price of fuel – Ls 0.40 per litre.
The wear and tear of tyres is calculated according to the standard per 1 set of tyres, which is Ls 0.02 per 1 km.

Prepare the annual budget of operating costs of one truck by showing the following:
- labour costs (salaries);
- notionally fixed costs;
- cost of materials;
- total amount of costs;
- costs of materials and total costs in lats per 1 km.

Relevant and non-relevant costs

Relevant (important for decision making) costs and revenues are those costs and revenues which will be changed as the result of our decisions.

Non-relevant costs (revenues) are costs that are unaffected by the outcome of a decision

Controllable and uncontrollable costs

Controllable costs are those costs for which the manager of a department is responsible. These costs can be controlled by the manager – influenced by management decisions.

How much of the costs should be controllable and how much of the costs should be uncontrollable depends on the location of the respective enterprise department in the hierarchical organisation of the enterprise. The lower the department in the hierarchical structure of the enterprise the smaller the amount of controllable costs, and vice versa. Generally enterprises are responsible for all of its costs.

From the point of view of cost accounting enterprise units are responsibility centres. There are three levels of responsibility centres:

1) cost centres – the managers of these centres are liable only for costs, the majority of lower level managers control these centres;

2) profit centres – the managers of these centres are responsible not only for the costs, but also for the revenues, these centres could be affiliates of a larger enterprise, for example;

3) investment centres – the managers of these centres are liable for the costs, the revenues and even for the contribution of capital (investments), the examples of such centres could be the associated enterprises.

2.2. Cost classification

Depending on the purpose chosen costs are classified (grouped) into logical groups:

- by cost accounting purposes;
- by function and definition;
- by management purposes.

Costs can be classified by using various methods. Each individual method of classification corresponds to the purpose which this cost information serves.

2.2.1. Cost classification by purpose of cost accounting

Table 2.2 Cost classification by purpose of cost classification

Cost classification purposes	Classification
1. Costs for prime cost calculations	Current and historic costs Product costs and period costs Direct and indirect costs Production costs and non-production costs Variable and fixed costs Order and process costing systems
2. Costs for decision making	Variable and fixed costs Relevant and non-relevant costs Avoidable and unavoidable costs
3. Costs for control and planning	Controllable and uncontrollable costs Variable and fixed costs

The choice of the method of classification is defined by the achievable goal through analysis of the cost information.

Table 2.3 Cost classification

Cost classification	Purpose
How costs are affected by changes in the volume of activity: ♦ Fixed costs; ♦ Variable costs.	♦ Budget planning ♦ Budget control ♦ Adoption of other decisions
Whether the manager responsible can influence or control the costs: ♦ Controllable costs; ♦ Uncontrollable costs.	♦ Control
Whether the costs have been incurred or should have been incurred: ♦ Actual costs; ♦ Budgeted or standard costs.	♦ Budget control
Whether the costs should be incurred or whether it would be possible to avoid them	♦ Budget planning ♦ Adoption of other decisions

by taking special decisions: ♦ Avoidable costs; ♦ Unavoidable costs (costs incurred in clearing of long-term liabilities).	
Whether the costs will be affected by a certain management decision and how: ♦ Necessary (relevant) costs; ♦ Additional costs.	♦ Decision making

2.2.2. Cost classification by function and type

Classification of costs by their functions and types according to the Republic of Latvia Law on Annual Accounts has been provided in Table 2.4.

Table 2.4

Composition of business costs by their functions and types

If the period costing method is applied	If the turnover costing method is applied
1. Costs of materials 1.1. Izejvielu un palīgmateriālu izmaksas (pieskaitot pirkšanas cenai ar iegādi saistītos izdevumus) 1.2. Other external costs (costs on production works that have been outsourced to other legal or physical entities) **2. Costs of personnel** 2.1. Salaries (payment for labour in cash and in kind) 2.2. Retirement benefits from the enterprise assets etc. costs 2.3. Other social insurance costs (social insurance deductions, other payments to employees, insurance payments, other social benefits to employees) **3. Writing off the value of assets** 3.1. Depreciation of fixed assets and writing off the value of material investments 3.2. Writing off the value of fixed assets above the regular amounts written off **4. Other operating costs** 4.1. Occupational safety related expenses 4.2. Enterprise property insurance payments 4.3. Business trip expenses 4.4. Transportation, communication, commission fee, advertising, marketing and goods insurance costs 4.5. Other expenses which are not included in	**1. Production cost of goods sold** **Direct costs** 1.1. Costs of lubricants, prime materials and auxiliary materials: ✓ costs of raw materials and prime materials; ✓ purchase costs of auxiliary materials; ✓ cost of purchases of heating materials, fuel, lubricants; 1.2. Delivery costs of materials purchased 1.3. Payment for any outsourced works and services 1.4. Labour costs of permanently employed workers with additions to social insurance **Indirect production costs** 1.5. Production overheads: ✓ salaries to personnel employed for the management and servicing of production with additions to social insurance; ✓ costs of fixed asset repairs and operation; ✓ costs of heating in production facilities, lighting etc. costs; ✓ depreciation of fixed assets; ✓ lease payment; ✓ insurance payments; ✓ general auxiliary materials; ✓ other indirect production costs. **2. Sales and distribution expenses:** ✓ transportation, communication, commission fee, advertising, and marketing costs;

the previous cost items 4.6. Costs of scrapping and disposal of fixed assets 4.7. Contingent losses from previous years disclosed during the reporting year 4.8. Miscellaneous costs that are not related to the basic operations of the enterprise **5. Extraordinary costs** 5.1. Losses incurred as the result of natural disasters and the receipt of insurance remuneration	✓ insurance payments for goods; ✓ salaries and additions to social insurance; ✓ depreciation of buildings, inventory, machinery (amortisation); ✓ costs of repairs and maintenance of fixed assets used in basic operations; ✓ maintenance expenses for the premises, including the lease (rent) fees, lighting, security, cleaning etc. ✓ stationery expenses, including postal and other expenses. **3. Administration costs:** ✓ salaries and additions to social insurance; ✓ depreciation of buildings, inventory, machinery (amortisation); ✓ costs of repairs and maintenance of fixed assets used in basic operations; ✓ value of material investments and current assets written off; ✓ office maintenance expenses, including the lease (rent) fees, lighting, security, cleaning etc. ✓ stationery expenses, including postal and other expenses. **4. Extraordinary costs (see the composition 1. in column 1)**

2.2.3. Classification of costs by level of management

Main method used in cost management is the 'cause–consequence' method which allows the assessment of correlation between several solutions (decisions) and the level of costs.

In order to use this method in the process of cost management with the help of planning, accounting, control and analysis, first the controllable costs must be identified.

- Centralised costs, because these costs describe the overall business performance results – Level 1;
- De-centralised costs, as these describe the performance results of the individual enterprise units or even groups of employees and individual employees – Level 2.

Table 2.5 Description of the cost management levels

Cost management levels	Cost planning, accounting, control and analysis
1. Level 1 – centralised cost management	• Direct and indirect; • Variable and fixed; • Production, administration, selling.
2. Level 2 – de-centralised cost management	• By types of individual products (services) and their groups;

	• By individual clients (customers) and their groups; • By centres of responsibility.

2.3. Prime cost calculations

2.3.1. Types and systems of prime cost calculations

What are the costs of goods sold, produced or services provided and what is their prime cost?

This information is required in the process of the profit or loss account preparation and valuation of stock of goods for sale and unfinished products as well as in the pricing process.

There are two main alternative systems for the prime cost calculation: calculation of the full production prime cost and the variable cost calculation.

If the enterprise did not have the system for cost accounting and the calculation of the prime cost, the management would not have sufficient information about the following:

- the profitability the individual units of production, services provided or works performed (the earning capacity);
- the earning capacity of the different enterprise departments or operations;
- the dynamics of the different costs of enterprise without which no accurate cost planning is possible;
- the variances between the actual and the budgeted results;
- setting of selling prices in such a manner that they would not only cover the costs but also provide with an acceptable margin of profit;
- the effect laid on the profit margin by any increases or decreases in output volume or closing-down of any production lines or units.

The system of cost accounting and calculation of the prime cost and the information generated by the management accounting may differ on an enterprise by enterprise basis due to the following:

- the enterprises differ by size and structure as well as by their activities, type of products or services;
- the structure of management may be different. Pursuant to the organisational structure, in enterprises with a higher degree of de-centralisation the need for management accounting generated information to managers with lower authority is much larger than in centralised enterprises.

Any business is interested to know what the cost of enterprise operations is.

It is very simple to assess the profit if an enterprise produces only a single type of products or provides a single type of services, especially if the enterprise is selling as many of its goods as it produces. Profit is revenue less costs.

The calculation becomes considerably more complex if an enterprise produces more than just one type of product; there are stocks of raw materials, unfinished goods and goods for sale.

The purpose of prime cost calculation is the assessment of profitability of the products and the value of stocks.

Based on the product prime cost calculation the production cost of sales are defined in the income statement and the value of goods for sale – in the balance sheet.

The object of calculation of the prime cost is a product, a service or anything else for which the prime cost is calculated. Usually the object of the prime cost calculation is something that can be sold to consumers or it can also be a smaller (such as production operation) or a larger object (such as production line) of calculation.

Prime cost is the total amount of costs for the production and sale of one unit of a certain type of goods or the development and sale of one unit of a certain type of services over a certain period of time.

The calculation of the prime cost of a product (service) is used in business in:

- the process of making business-related decisions;
- budget planning, for example, defining the costs involved, profits made, etc. in the production of individual types products;
- control of business performance results, for example, by controlling the level of costs of the individual types of products;
- in valuation of the stocks of goods for sale and unfinished products.

Distinction is made between the following ***types of cost estimates***:

- ***Preliminary cost estimate***, which is prepared prior to the commencement of the production of any type of product; this estimate is sometimes referred to as the estimated offer;
- ***Post-estimate***, which is prepared by using the actual costs accumulated in the financial accounts in previous month, year;
- ***Standard (normative) cost estimate*** – prepared by using the so called standard costs (the arithmetical mean value, which is defined by using the real costs of previous periods, absorption rates, and introducing the necessary adjustments related to any predictable changes in the future).

Standard cost estimates focus on the future and is prepared for a long time period.

Two prime cost estimation ***systems*** are distinguished:

- ***Full prime cost estimation*** - includes both the direct and indirect costs;
- ***Variable prime cost estimation*** including only the variable and fixed costs that can be traced to the specific unit of product.

Their application is related to the prime cost estimation system selected.

Table 2.6 Types of estimates and their application in business operations

Selected goal	Cost estimation system	Type of cost classification	Division of costs
Estimated offer – cost control	Full estimate of production costs	Allocation of costs to cost objects	• Direct • Indirect (overheads)
Standard and post-estimate – adjustment to the market needs	Variable production cost estimate	Cost dependence on changes in the volume of activity	• Variable • Fixed

In order to prepare the prime cost estimate of a product (service) all operating costs must be divided accordingly into:

1. By types of costs: direct, fixed, variable.

2. By points of cost incurrence: production, administration, selling.
3. By cost units (cost estimate objects) – specific products and services.

The type of cost breakdown should provide answers to the following questions:

1. What type of costs has been incurred?
2. Where the costs have been incurred?
3. What can the costs be traced to?

2.3.2. Determination (calculation) of direct and indirect costs

For the calculation of **direct costs** and their inclusion in the prime cost estimates, pre-defined standard rates of materials, labour and other direct components are used.

Example

An enterprise manufactures product A. The budgeted volume of material X, which is necessary for its production, is q=2 kg. The budgeted purchase price of one kg of material X is C = Ls 6.00. The usage of labour in the production of product A is t=0.5 man hours. The budgeted rate of labour in Ls is t=Ls 2.00 per man hour of work.

Let us calculate the direct costs of product A, given the above information:

Table 2.7 Assessment of direct costs of product A

Measures	Costs, Ls	Estimates
1. Direct costs of materials, Im	12,00	Im=C×q 6×2=12
2. Direct labour costs, Id	1,00	Id=Lst×t 2,00×0,5=1,00
Total prime costs	13,00	12.00+1,00=13,00

In order to assess the indirect amount of costs that should be attributed to the prime cost of the product (service), the following activities are required:

- sorting of indirect costs by the point of incurrence and their type;
- assess the volume of activity;
- select the absorption rates (In);
- to split the indirect costs by objects of cost calculation.

The process of attributing the indirect costs to the prime cost is called **absorption** and the indirect costs are often referred to as overheads.

All indirect costs are added to the prime cost of products by using the **absorption rate**.

Absorption rate = amount of indirect costs/ volume of activity

The absorption rates of indirect costs are defined by applying several measures of the level of activity.

Table 2.8 Measures of the level of activity

Level of activity	Absorption rates
Number of output units	Ls per unit of output
Consumption of direct labour in hours	Ls per one hour of labour
Machinery operating time in machine hours	Ls per machine hour

Direct labour costs	In percent from direct labour costs
Direct material costs	In percent from the cost of materials
Prime costs	In percent from the prime costs
Production costs	In percent from the production costs
Amount of sales (net turnover)	In percent from the sales revenue

Several methods are used for tracing and apportionment of overheads to the objects of cost estimates. They include:

1. Method 1 – allocation of indirect costs by cost estimate items in proportion to the volume of goods sold.
2. Method 2 – apportionment of indirect costs in proportion to the rate of labour consumption of each product.
3. Method 3 – apportionment of indirect costs in proportion to the selected basis for cost absorption.

Method 1 is recommended if an enterprise produces and sells one type of products or services, i.e., in an enterprise with a narrow specialisation. The amount of indirect costs accumulated or budgeted in the enterprise accounts can be divided by the number of products manufactured or sold.

Example The following indirect costs have been budgeted in an enterprise:

Table 2.9 Description of indirect costs

Measures	Ls/year
1. Indirect production costs	80 000,0
2. Sales and distribution expenses	2 000,00
3. Administration expenses	38 000,00
Total:	**120 000,00**

An enterprise manufactures and sells a single product A. The budgeted production and sales volume of product A is 20,000 units per year. Using the above given data and Method 1 or indirect cost apportionment we can assess the rate of indirect costs per unit of product A to be added to its prime cost.

Table 2.10 Indirect cost estimate, Ls/unit

Measures	Indirect cost rate, Ls/unit	Estimates
1. Indirect production costs	2,00	80 000/40 000=2,00 Ls/unit
2. Administration expenses	0,95	38 000/40 000=0,95
3. Sales and distribution expenses	0,05	2 000/40 000=0,05
Total	**3,00**	

By using the information provided in the above table we can establish the prime cost estimate for product A.

Table 2.11 Prime cost estimate for product A

Cost items	Costs, Ls	Estimates, Ls
1. Direct costs of materials	12,00	
2. Direct labour costs	1,00	
Prime costs	**13,00**	12,00+1,00=13,00

3. Indirect production costs **Production prime cost**	2,00 **15,00**	 13,00+2.00=15,00
4. Administration costs 5. Selling, storage and distribution costs **Full prime cost**	0,95 0,05 **16,00**	 15,00+0,95+0,05=16,00

In enterprises that produce and sell different types of products the indirect costs have to be assessed for each product separately.

Let us look at the application of **Method 2** by using an example.
An enterprise is planning to manufacture and sell products A and B. The information regarding the budgeted operating data is given in the table below.

Table 2.12 Information about the budgeted enterprise operating data

Measures	Level of activity, per year on average
1. Indirect production costs, Ls/year	80 000.00
2. Selling costs, Ls/year	2 000.00
3. Administration costs, Ls/year	38 000.00
4. Direct labour usage for the manufacturing of product, hour/unit:	
- for product A	0,50
- for product B	0,25
5. Budgeted output and sales volume, N – units:	
- for product A	40 000
- for product B	20 000

We will use the information given in table above and Method 2 for cost apportionment in order to assess the amounts of indirect costs to be added to the prime cost of products A and B.
First, we will assess the absorption rates of the indirect costs. In order to assess the rates, the consumption of total labour hours for the production of A and B must be estimated.

Table 2.13 Budgeted direct labour hours, hours/year

Measures	Total consumption of labour hours, hours/year	Estimate
1. for product A	20 000	0,5*40 000=20 000
2. for product B	5 000	0,25*20 000= 5 000
Total	**25 000**	

By using the information given in the above table we will further assess the absorption rates of indirect costs (In), in Ls per one direct labour hour.

Table 2.14 Absorption rates of indirect costs, Ls/hour

Measures	Absorption rate (In), Ls/hour	Estimates

1. Indirect production costs	3,20	80 000/25 000=3,20
2. Administration expenses	1,52	38 000/25 000=1,52
3. Sales and distribution expenses	0,08	2 000/25 000=0,08
Total:	**4,80**	

Finally we can assess the indirect costs to be added to the prime cost of products A and B by using the absorption rates for indirect costs and the information on the rate of labour consumption required for each product.

Table 2.15 Indirect cost estimate, Inet, Ls/unit

Indirect cost measures	**Cost estimates**					
	Product A			***Product B***		
	In, Ls/hr	**T, hr**	**Inet, Ls/unit (In*t)**	**In, *Ls/hr***	***T, hr***	**Inet, Ls/unit *(In*t)***
1. Indirect production costs	3.20	0.5	1.60	3.20	0.25	0.80
2. Administration expenses	1.52	0.5	0.76	1.52	0.25	0.38
3. Sales and distribution expenses	0.08	0.5	0.04	0.08	0.25	0.02
Total:			**2.40**			**1.20**

By using Method 2 not only the direct labour consumption rate can be used as the measure of the level of enterprise activity, but also the machine time consumption in machine hours which is more suitable for production facilities with a high level of mechanisation or automatisation. By using the machine hours the estimates are performed exactly as in the above discussed example.
The calculated results are used for the prime cost estimate of product A.

Table 2.16 Prime cost estimate for product A

Cost items	**Costs, Ls**	**Estimates**
1. Direct costs of materials	12,00	
2. Direct labour costs	1,00	
Prime costs	**13,00**	**12,00+1,00=13,00**
3. Indirect production costs	1,60	
Production prime cost	**14,60**	**13,00+1,60=14,60**
4. Administration costs	0,76	
5. Selling, storage and distribution costs	0,04	

Full prime cost	**15,40**	**14,60+0,76+0,04=15,40**

The same way a full prime cost estimate can be prepared for product B.

By using Method 3 in the apportionment of indirect costs to the units of cost estimate one of the cost estimate items which has been predefined for prime cost calculations by the enterprise is used as the basis of absorption.

2.3.3. Calculation of variable costs

Example A sales company has received an offer to purchase goods. The price per unit of goods is Ls 4.00.

Table 2.17 Estimate of proportional variable costs

Volume of folders purchased and sold per month (Q), units	Purchase price = variable costs, Ls/unit (I_m^v)	Variable costs of goods sold (I_m^k), Ls/month
0	0	0
500	4,00	2000,00
1000	4,00	4000,00
1500	4,00	6000,00
2000	4,00	8000,00

Example A sales company receives an offer to purchase goods at the price of Ls 4. The following discounts are offered:

Table 2.18 Discounts on goods

Size of the purchase batch, units	Volume discounts
501 – 1000	10%
1001 – 1500	20%
1501 – 2000	30%

Table 2.19 Estimate of regressive variable costs

Volume of folders sold per month (Q), units	Purchase price = variable costs, Ls/unit (I_m^v)	Variable costs of goods sold (I_m^k), Ls/month
0	0	0
500	4,00	1500,00
1000	3,60	2700,00
1500	3,20	3600,00
2000	2,80	4200,00

Example An enterprise has requested its employees to work overtime in order to increase the volume of output. Considering that in the payment for overtime higher rates are used, along with the increase in the sales volume the variable costs also increase (see 2.20**.** Table 2.20).

Table 2.20 Estimate of progressive variable costs

Volume of units sold per month (Q), units	Variable costs (I_m^v), Ls/unit	Total variable costs of goods sold (I_m^k), Ls/month
0	0	0

500	8,00	4 000,00
1000	9,00	9 000,00
1500	10,40	15 600,00
2000	12,20	24 400,00

By adding the fixed and the variable costs we arrive at the total costs.

Total costs (I^k) = Fixed costs ($I_p{}^k$) + Variable costs ($I_m{}^k$)

2.4. Questions

1. Which types of costs are non-existent:
   - direct overheads;
   - direct material costs;
   - indirect labour costs;
   - fixed production costs;
   - fixed prime costs.
2. Which of the statements below are correct:
   - overheads cannot be completely traced to the cost unit;
   - direct costs can be traced to the cost unit;
   - prime costs cannot be fully traced to the cost unit;
   - fixed costs vary with the level of activity.
3. Cost unit is:
   - a product manufactured by an enterprise;
   - production facility of an enterprise;
   - production process;
   - changes in the enterprise stock level.
4. Indirect costs are the following:
   - rent payments for the building;
   - amortisation of the building;
   - employee salaries;
   - heating of the production unit.
5. Which of the statements below are correct:
   - the basis for allocation of costs are identical for all costs;
   - irrespective of the basis used for re-allocation of costs, the outcome of the prime cost calculation will not change;
   - full production prime cost of a product can vary depending on the selected absorption rate.
6. The costs amounting to full production prime cost of a product are the following:
   - selling costs;
   - materials storage costs;
   - goods for sale storage costs;
   - machinery repairs workshop costs.
7. Which of the statements below are correct:
   - total enterprise costs are divided into production and non-production costs;
   - total production costs are divided into variable and fixed costs;
   - variable costs increase in proportion to the volume of activity.
8. Which of the statements below are correct:

- fixed costs can increase as the levels of activity rise;
- the measurement unit of a ton-kilometre is money;
- management accounts are a part of financial accounting.

3. Prime cost

3.1. The meaning of prime cost

The prime cost of a product is the total amount of all costs incurred for the certain type of production over a certain period of time. The prime cost of products is the most important measure of efficiency of business performance.

Any reduction in the prime cost without harming the quality of the product is an important condition for ensuring the competitiveness of the products in the market. Besides, it is a source of additional profit-making. The market price of products generally corresponds to the average costs of manufacturing the product and the variances in any of the directions are caused in the effect of the market demand or offer. If the production costs of an enterprise exceed the industry average costs this excess will not be compensated on the account of customers. This may reduce the income earned by an enterprise. However, if an enterprise will be able to reduce the production costs compared to other enterprises that manufacture similar products, it will be possible to generate additional income, or by reducing the price, stimulate the sales of the products.

In order to manage business activities successfully, planning and control of the work process must be carried out, the stocks of goods for sale evaluated. In order to do that the cost per unit of output must be known. The prime cost of products is one of the starting points in setting the sales price.

The prime cost can be calculated by applying several methods.

The main tasks involved in the assessment of the prime cost are as follows:

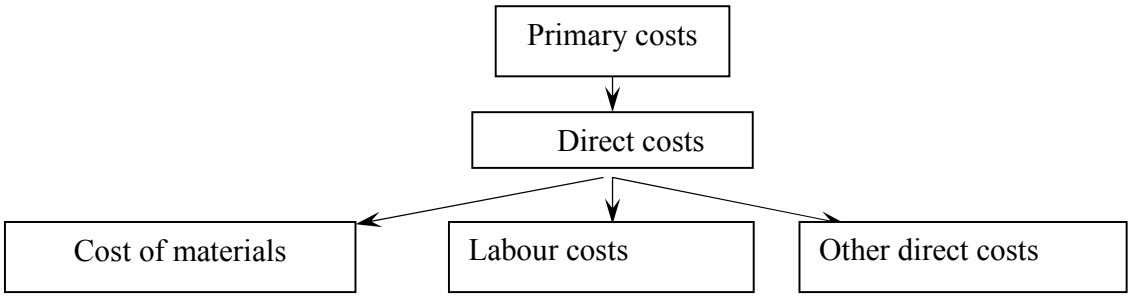
1. to provide data on the business pricing policy in order to be able:
    - to determine the most favourable price with the maximum level of profit possible in conditions of competition;
    - determine the lowest permissible price limit;
    - to calculate the price of an offer taking the specific circumstances into account;
    - to choose whether particular products should be produced or purchased.
2. to provide the annual balance sheet data for the valuation of stock produced in-house;
3. provide the necessary data for production and sales planning;
4. to calculate the necessary data for cost control.

The prime cost of products includes business costs that are attributable to the production and sale of goods. Prime cost calculations are not restricted only to the assessment of the full production prime cost, presenting the costs incurred in the period, but the prime cost also serves as the basis for the following:

- pricing of products;
- calculation of profit or contribution;
- calculation of profitability.

The largest part of costs in the prime cost estimates are made up by the so-called basic costs – direct cost in this case.

Figure 3.1 Primary cost elements



If a firm manufactures a single type of production, the prime cost calculation can be easily made, while if an enterprise manufactures products of different types, the costs have to be divided into cost groups for each particular type of product, by separating the direct costs form the indirect costs. If a single type of products is manufactured all costs are attributable to this product.

Depending on what and how an enterprise manufactures as well as on the intended use of the estimated results, the following cost estimates are prepared:

1. absorption costing or full prime costing method (see 4. Session 4);
2. marginal costing or variable costing method (see 5. Session 5);

3.2. Types of prime cost accounting

From the theoretical point of view **the object of cost estimate** can be an individual product, type of products or a group of similar products as well as a measure of services or activities. The cost unit is believed to be a unit of production for which the prime cost is being assessed. Dependent on the type of business an object of cost calculation can be a group of similar products (a batch), a contract or an order as well as an operation, process etc. However, it is recommended for enterprises with a large range of output (variety) to expand the objects of cost estimation in order to simplify the accounting and the decision making on price setting. Only such products can be grouped that have been manufactured from similar raw materials and components, by applying similar technologies. Upon the performance of costing the prime cost of all types of products (name, sort, size) included in any particular group of products is obtained. In order to do costing

for any particular object of cost estimation, apart from the goods for sale also unfinished products must be taken into consideration.

Goods for sale are products the processing of which has been completed and which have been transferred to the warehouse or delivered to the customer. As a result of the prime cost estimation reasonable confidence must be obtained that the production of goods will be profitable. The prime cost of products serve as the basis for pricing, estimation of profitability of the return made on these products. Great role in the enterprise management and planning and decision making activities is played by the main tasks in the calculation of the prime cost of the cost units which are as follows:

a) to provide data for the enterprise pricing policy - to calculate the most favourable prices with the maximum possible profit in conditions of competition, to determine the lowest permissible price limit, to calculate the offer prices for specific orders, to provide the data for decision making on whether certain products should be manufactured in-house or purchased, as well as for other calculations necessary for decision making and generally – for a long period of time;
b) to provide the annual balance sheet data for the valuation of stock produced in-house;
c) provide the necessary data for production and sales planning;
d) to calculate the necessary data for cost control;
e) provide the data necessary to assess the efficiency of business activities.

As according to the generally accepted principles all production costs are subdivided into two categories: the direct and the indirect costs, then the prime costs of the objects of cost estimation are the total amount of the direct costs and the indirect costs apportioned to the object of cost. It is also important to identify the unit of costing, i.e., the measurement units of the products used the prime cost calculation. In practice it is accepted that the units of costing should describe the substance of the respective type, reflect the measurement unit of product quantity, these should be coordinated in order to estimate the prime cost of similar production. The measurement units used in the prime cost estimation are mainly physical (units, tons, kilograms, metres and others).

The prime cost is the share of production costs expressed in monetary terms that absorbs the value of the means of production used, the value of labour required in the creation of a product and partially also the value of labour added to a product (for example, statutory social insurance). It can be concluded that the prime cost of goods for sale is the total amount of all the costs incurred as a result of production of a certain type of product over a certain period of time. The prime cost of goods for sale is consists of the costs of direct, indirect materials and the costs of direct or indirect labour used or personnel costs. Or else the prime cost is defined as the production costs incurred in the production of goods. This is calculated by adding the costs of the raw materials, basic and auxiliary materials used at their purchase costs or auxiliary costs which are directly related to manufacturing of the goods. The prime cost could be compared to the share of costs that is equal to the total amount of direct and indirect costs attributable to one unit of production. The prime cost of products comprise those costs incurred to the enterprise which are production-related. The prime cost estimates also include overheads that cannot be upon incurring traced to individual cost units, as they refer collectively to all products or enterprise departments.

Two types of prime costs are distinguished:

- **the production costs or the prime costs of the output produced;**
- **the costs of production realised or sold**.

The prime production cost includes total production costs as defined by Article 30 of the Republic of Latvia Law on Annual Accounts. The prime cost of production is used for the valuation of the

stock of goods for sale and unfinished goods produced internally and its presentation in the annual balance sheet in compliance with the restrictions set out in Article 32 of this law which regulates, how the stock balances must be valued according to the prime cost of production or purchasing as of the date of the balance sheet, besides, by certainly applying the lowest of the prices. This law also provides for the justification of the value of current assets by the prime cost of their purchasing or manufacturing which is calculated by adding all purchasing costs to the purchase price.

The prime cost of goods for sale must include any unfinished products at the period opening date, any primary materials used, the labour costs of workers employed in the production, production overheads after excluding the unfinished products at the period closing date.

The cost of goods sold, however, must include the period opening stock of goods as well as the prime cost of goods manufactured, from which the stock of goods for sale at the period closing date are deducted.

The primary materials of production are believed to be the raw materials or other materials that have been physically included in the contents of the goods produced. It can be stated that these are raw materials which are directly used in the production output. The value of any primary production materials or direct materials is assessed based on the balance of the primary materials at the period opening date and the amount of materials purchased from which the period closing balance of the primary production materials is deducted. This value can be assessed with the help of an internal enterprise document – the sales report where the information about the amount of materials purchased and used is provided. The auxiliary production materials or indirect materials, however, as it has been stated before, are those raw materials and other components that have not been physically included in the contents of the output produced, but which are necessary for the performance of the process itself. For example, this could be the packing material or the box in which the products are transported to the customer as well as different types of motor oil necessary for running of plant and machinery.

The following cost items should not be included in the prime cost: selling (transportation costs, marketplace renting costs), administrative costs that are associated with the management process, control and the general administration of the enterprise. Although the prime cost of goods sold includes the costs of selling and administration. This prime cost figure is mainly used for planning and assessment of the period performance results and cost control.

The actual prime cost of production is the real and not the budgeted cost that has been incurred during the reporting period in the result of production of goods. In order to determine the prime cost of goods sold all resulting costs posted in the accounts of Group 7 in the chart of accounts are adjusted by any decrease in the value of unfinished goods and goods for sale – by adding, while by any increase in the value of unfinished goods and goods for sale – by subtracting.

The following methodology is most often used in the calculation of the prime cost: systems of costing of orders and processes and the absorption and marginal costing systems.

Systems of order costing are used in accounting for large, universal cost objects (ships, aircraft and railway rolling stock) when the costs of each object are accounted for individually. The simplest method of the prime cost calculation per unit is the order costing system. This can be used if an enterprise produces only one type of product. The order costing system is usually applied for large unique objects, for example, buildings, constructions, aircraft, ships as well as in the mining of one particular mineral resource and in similar undertakings. The prime cost per unit of products is therefore calculated by dividing the total amount of costs by the number of output units.

Prime cost per unit of output = total amount of period costs/number of period output units

This calculation is used in cases, where it is possible to determine the direct costs of each product with an acceptable degree of certainty and where the overheads can be allocated to each type of products by assessing the total costs of each type of products, if there are no other types of products generated concurrently by the same production process. If the respective production unit has any servicing departments the costs incurred by those departments can be grouped by their cost drivers, for example, using the meters for the power consumed, using the statements on usage of materials as well as by assessing the labour hours used, by using the salary estimates on one-off jobs or time-based working hours. The total cost amount of all servicing departments will be transferred to the production unit. Respectively, this type of calculation is considered to be the simple single period allocation costing as it includes total production processes within a single period of time. The following direct costs are separated in this system of costing: direct labour, materials and other direct and overhead costs added to the goods for sale.

The process costing system is applied in mass production, for example, in the chemical and the food processing industry, when by calculating the prime cost per unit it is possible to attribute the total amount of costs to the number o units of output produced.

The costs incurred in the production process are apportioned to the entire process and then the average cost per unit is calculated. Process costing system is used if a large number of identical units of output must be produced. This method is widely used if the production process is uninterrupted, for example, in oil refineries, paper and also in the food industry – in the production of bread, candies and meat. Process is presented in accounts with the incoming costs being disclosed on the left and the outgoing costs – on the right side of the account. There may be occasions when two or more processes follow each other in a sequence; in this case an individual account of unfinished production is opened for each of these processes. In this respect the following example can be considered:

Table 3.2 (Part 1) Process Account 1

Incoming costs			**Outgoing costs**		
	Number of units			Number of units	
	Direct material			Goods	
costs	10000	800	for sale	10000	120
	Direct labour				
costs		200			
	Production				
overheads		200			
Total	10000	1200		10000	120(

It can be seen that after Process 1 the prime cost per unit will be 12 lats per unit (120,000/10,000)

Table 3.2 (Part 2) Process Account 2

Incoming costs			Outgoing costs	
	Number of units	lats	Number of units	lats
	Direct material costs from finished goods of			
Process 1	10000	120(		
	The amount of direct material costs added			

in this process	8000	400			
Direct labour costs		200	Output of finished goods	18000	200(
Production overheads		200			
Total	18000	200		18000	200(

After Process 2 the prime cost of one unit will be 200,000/18,000 = 11.11 lats.

There are losses incurred in the production process which are discovered by subtracting the number of units in process from the number of incoming units. This method also includes also the calculations of normal and abnormal losses. Normal losses include the weight loss due to drying, vaporisation, cut-offs. These are also referred to as natural losses. Abnormal losses are incurred if the levels of normal losses are exceeded. The following example can be attributed to this situation: The production in an enterprise is organised into two processes. Normal losses are 10% of the materials submitted to production. The price per unit of waste from Process 1 is Ls 0.5, while in Process 2 – Ls 3.00

Table 3.3 (Part 1) Process 1

	Number of units			**Number of units**	
Direct material costs	4000	162	Normal loss	400	20
Direct labour costs		80(	Costs of finished goods	3500	350(
			Ls(36200 – 200)/90%of4000 *35		
Production overhead		12(	Abnormal loss (90% of 4000) – 3500 units	100	10
Total	4000	362		4000	362

3.3. Table 3.3 (Part 2) Process 2

	Number of units			**Number of units**	
Direct material Costs from Process 1	3500	150	Normal losses of production process	600	18(
Added direct material costs	2500	380	Finished goods	5600	840
Direct labour costs		200			
Production overhead		240			
	6000	828			
Economy of normal losses	200	30			
Total	6200	858		6200	858

In this example the costs per unit of finished products include also normal losses.

Ls(82800 – 1800)/90% of 6000 units = 15. Normal losses:

5600 – (90% of 6000) = 200 units

With the help of process costing it is possible to precisely apportion the costs if in the course of the production process any unfinished products have been generated that is also brought forward

to the following production process. For this purpose the materials and conversion costs can be used. As the materials are added in full amount, i.e., by 100%, then such products may be found that do not use completely the materials intended for them. However, the costs of conversion are costs that are accounted for in the course of production, by adding the direct labour costs and the overheads, which are added gradually in the course of the process. Equivalent units of unfinished products are multiplied by the stage of completeness of the unfinished goods. The costs attributable to unfinished products are presented in the process calculation as the incoming costs. If unfinished products are generated both at the beginning and at the end of the process, these costs are presented as the incoming as well as the outgoing costs, by studying the time for generating the unfinished products. Upon costing one unit of unfinished products production costs can be allocated by using the FIFO method and the weighted average method. Thus the total costs incurred (the costs of materials and conversion of unfinished and finished products per period) are attributed towards the total equivalent units for finished and unfinished products.

In the case of absorption costing all variable and fixed costs are attributed to the prime cost. Prime cost arrived at by absorption costing consists of total material costs (the total amount of direct materials and indirect materials), the total cost of personnel (total amount of direct personnel costs and indirect personnel costs) and the total of other costs (other direct costs + other indirect costs). The full prime cost of goods sold however also includes the administration and selling, and distribution overheads. This method of costing includes the grouping and accounting of both fixed and variable costs. Absorption costing can be illustrated by the following example:

Table 3.4 Full prime cost estimate (in monetary units)

Types of costs:	**Product A**	**Product B**
1. Direct materials	8	24
2. Direct labour	12	8
3. Indirect:		
4. Variable	12	6
5. Fixed	4	1
6. Total	**36**	**39**
7. Selling and marketing:		
8. Variable	4	6
9. Fixed	4	3
10. Full prime cost of goods for sale	**44**	**48**

The aforementioned accounting system ignores the aspect of demand and offer. However, irrespective of this aspect some difficulties exist for the apportionment of fixed costs per unit, but the variable cost per unit remain constant, unchangeable. By continuing to analyse the previous example and, besides, studying also the demand for products A and B, given that the demand for product A is more flexible, but for B – completely inflexible, we can conclude that the proportion of the fixed costs added to product A should be larger, by thus reducing the prime cost of product B.

Marginal costing provides for the inclusion of only the variable cost in the production prime cost, while the fixed costs are written off to the profit and loss account. **The variable production prime cost**, as already evidenced by the name, consists of the following: the variable costs only, including direct materials, labour costs, production overheads. Respectively, the total variable

prime cost of goods sold also includes the variable selling, storage and delivery overheads. The study of the variable prime cost calculation can be continued on the basis of the previous example:

Table 3.5 Variable prime cost (in monetary units)

Types of costs:	**Product A**	**Product B**
1. Direct materials	8	24
2. Direct labour	12	8
3. Indirect:		
4. Variable	12	6
7. Selling and marketing:		
8. Variable	4	6
10. Variable production prime cost of finished products (minimum price limit)	**36**	**44**

3.3. Estimate of prime cost based on activity based costing (ABC)

Financial managers often face the use of a completely new terminology related to the prime cost calculation, methods and techniques of the management and financial accounting. Such terms appear in the vocabularies of accountants as activity based costing (ABC), target costing, activity based accounting and total quality management.

In this paper I would rather focus on the activity based costing which is most often denominated as ABC – a type of prime cost calculation based on cost assignment on the basis of activities that each product consumes. This method re-addresses the concern that the accountants have been facing for decades - the apportionment of indirect production costs to the products made.

The traditional prime cost calculation method is based on cost absorption and the indirect production costs are apportioned according to the following method:

- an organisation identifies and establishes cost centres**;
- cost centres may be production or service centres;
- wherever possible, indirect costs are directly apportioned to the cost centres;
- where the indirect costs are incurred jointly by several cost centres, they are proportionally split among the cost centres on an objective basis;
- the total indirect costs of the service cost centres are apportioned to the production centres;
- then the total indirect costs accumulated in the production centre are split, for example, in proportion to the machine hours or man hours consumed;
- the absorption rate is obtained as a result;
- this is used to absorb the indirect production costs to the production output;
- if the planned levels of activity are actually realised it is possible to fully absorb the indirect production costs within a short period of time.

This method can be successfully used if the range of products is limited and if the pre-defined rates are well planned based on achievable levels of the production budget volumes.

* Apportionment of indirect production costs is a method, how indirect costs can be apportioned to the goods produced or services provided. This is achieved with the help of the absorption rate (see Part 1 of the practical Example).

** Cost centre:

department, item of machinery or group of machinery items the costs of which may be directly or indirectly traced to the production units. Cost centres can be both the production cost centres, for example, the processing, finishing and packing units, or the service centres, for example, the production promotion units like technical maintenance, shop departments and the canteen.

Practical Example

Hockeyskill is an enterprise fitting into the category of small- and medium-sized enterprises which produces high quality hockey sticks. For several years the accountant has been absorbing the indirect production costs according to the method outlined above.

Enterprise has three main production cost centres. processing, finishing and packing.

The process of apportionment of indirect costs has been completed for the period ended 30 June 20X4 and the budgeted figures were as follows: (Budget)

(*see Table 1*)

It has been estimated that for an upgrade to the product the following amount of standard hours will be required for the production of one item of product.

(see Table 2)

The accountant and the production department manager have agreed on the following standard costs per unit of product.

(see Table 3)

Therefore, the prime cost of production of one unit according to the conventional method will be as follows:

(see Table 4, 5, 6)

Table 1

Cost centre	**Processing**	**Finishing**	**Packing**
Indirect costs	Ls 75,000	Ls 30,000	Ls 17.500
Machine hours	12,000	6,500	
Man hours			3,300

Overhead absorption rates per machine hour or man hour	Ls 6.25	Ls 4.62	Ls 5.30

Table 2

Processing	3,50	
Finishing	1,60	
Packing	0,30	
	5,40	standard hours

Table 3

Direct materials	Ls 17.50
Direct labour costs:	
(all primary workers are paid Ls 8 per hour)	

Table 4

Processing	3,50	hours	
Finishing	1,60	hours	
Packing	0,30	hours	
	5,40	**hours x Ls 8 / h**	**= Ls 43.20**

Table 5

	Ls
Direct materials	17,50
Direct labour costs	43,20

Direct production prime cost	60,70

Table 6

Indirect production costs:

Processing	3.50 hours	Ls 6.25	21,88
Finishing	1.60 hours	Ls 4.62	7,39
Packing	0.30 hours	Ls 5.30	1,59
			30,86
Production prime cost			Ls 91.56

Functional cost planning

For more complex enterprises, however, with the flexible and fast changing range of products the traditional method or prime cost estimation has turned out to be unsuitable for some occasions.

The prime cost estimation based on activity based costing or ABC offers a practically viable and more effective insight into the apportionment of indirect production costs.

The definition of *ABC* can be found in the financial and management accounting terminology of *CIMA* or the *Chartered Institute of Management Accountants* – cost apportionment to cost centres, based on the profit from operations, for example, ordering, generating and quality insurance.

Researchers like Bromwich and Bhimani have, for example, introduced such term as 'activity based costing' and have defined it as 'the research of value added activities within the production cycle that are driving costs and profits'. This mechanism motivates the managers to substantiate the purposes of all activities undertaken in the enterprise.

Some researchers state that ABC was initially used in USA in the beginning of sixties. Others – that this is a comparatively new technique and has become a technique in the 90-ties 90. of the 20th century.

Early experience of the USA focuses on the apportionment of selling and distribution costs.

In the very end of the 60-ties I worked in an enterprise which used new methodology for that period of time – the zero budgeting. We were experiencing large changes in cost analysis by getting transferred tot the prime cost calculation based on the apportionment of activity costs. By applying the zero budget planning we were oriented on the process that Bromwich and Bhimani underline as 'value adding'.

In the majority of theoretical materials the opinion has been expressed that Cooper and Kaplan have made the ABC the leading technique. They have created its structure and influenced the application of this technique among the practicing accountants.

Recently performed analysis shows clearly that the said technique is widely used in USA and in Europe.

ABC just like other techniques has its own terminology.

Terms like 'activity', 'cost driver', 'cost pool' and 'cost driver rate' each have a certain meaning.

Activity is defined as 'value adding process that consumes resources'.

Cost driver is 'an activity or a factor incurring costs', for example, in quality control departments cost drivers are the quality checks or audits.

Cost pool is 'the group of those indirect production costs that is attributable to a certain activity'.

For example, the indirect production costs related to quality control altogether form 'a cost pool'.

Finally, **the cost driver rate** is the result of splitting the cost pool for a certain activity with the certain amount of cost driver, for example, the cost pool of quality audit divided by the number of audits.

Application of ABC includes a set of procedures:

- accounting of indirect production costs;
- apportionment of indirect production costs in the establishment of 'value added' cost pools;
- identification of cost drivers;
- assessment of cost driver rates, i.e., cost pool/amount of cost driver;
- apportionment of indirect costs to the products manufactured / services provided, based on the demand for the activity.

The example below explains the procedure and the application of terminology and methodology as described above.

Continuing to analyse the example about *Hockeyskill* the accountant and the production manager has recently been analysing the value adding processes of the enterprise and have identified several activities, their cost drivers and their current volumes in the enterprise as a whole, and they have decided to use the ABC method.

(see Table 7)

The cost driver rates are assessed as follows:

(see Table 8)

Enterprise produces several products, one of which is an upgrade of the existing product. In the budget period ending 30 June 20X4 it is planned to manufacture 800 hockey sticks - upgraded versions. In order to achieve such level of output the following volume of activities will be required:

- 5 pre-fabricated components;
- 4 purchase orders;
- 2 standard maintenance plans;
- 10 movements of materials;
- 70 checks;
- 8 sales customers;

By using the ABC technique we can clarify the following:

(see Table 9)

Therefore, indirect production costs per unit = Ls 12,307 / 800 = Ls 15.38

We can see here that by attributing to the cost pools and identifying with the activities which are the cost drivers, the indirect production costs per unit are Ls 15.38.

The prime cost of production of one unit according to ABC as the indirect cost apportionment technique, are as follows:

(see Table 10)

In order to compare and to assess the effectiveness of both methods for apportionment of indirect costs to the overall range of products, *Hockeyskill* will need to fully analyse the volume of the cost driver in the context of 'its value adding activities' and their impact on the budgeted range of products.

Some would probably say that in comparison with the traditional approach in the apportionment of indirect cots, the ABC method allows for a more precise assessment of the production costs, however, the most recent studies have proven that by improving the quality of information regarding the costs and of the management accounts, it provides with a deeper insight into the production economy and those resource-consuming activities that being related with labour and capital provide the benefit which we know as 'the value added'.

Hopefully readers would now better understand the ABC and be able to see its usefulness and possibilities of application in their own business environments.

Budget plan for the quarter ended 30 June 20X4

Table 7

Activity	Cost pool	Volume of cost driver
Preparation of the process	47,500	100 pre-fabricated components;

Procurement of materials	9,000	50 purchase orders;
Technical maintenance	10,000	10 standard maintenance plans;
Storage of materials	22,500	2,000 movements of materials
Quality control	20,500	250 checks;
Processing of orders	13,000	300 customers
	Ls 122.500	

Table 8

Ls 47,500 / 100	=	Ls 475 per pre-fabricated component
Ls 9,000 / 50	=	Ls 180 per purchase order
Ls 10,000 / 10	=	Ls 1,000 per planned cycle of technical maintenance
Ls 22.500 / 2,000	=	Ls 11.25 per movement
Ls 20.500 / 250	=	Ls 82 per check/audit
Ls 13,000 / 300	=	Ls 43.33 per customer

Table 9

			Ls
Preparation	Ls 475 x 5	=	2,375
Procurement of materials	Ls 180 x 4	=	720
Technical maintenance	Ls 1,000 x 2	=	2,000
Movement of materials	Ls 11.25 x 100	=	1,125
Quality control	Ls 82 x 70	=	5,740
Processing of orders	Ls 43.33 x 8	=	347
			Ls 12.307

Table 10

	Ls	
Direct production prime cost as stated above	60,70	(see the previous part of the practical example)
Indirect production costs	15,38	
Production prime cost	Ls 76.08	

3.4. Questions

1. Describe the term of prime cost.
2. Name the elements of prime cost.
3. What is absorption costing?
4. What is marginal costing?
5. Describe the process costing system?
6. Information on the actual costs are provided to the management by:
   - P&L statement;
   - Balance sheet;
   - Business plan;
   - Enterprise budget.
7. What is an alternative system for absorption costing?
   - the prime cost estimates of products;
   - marginal costing;
   - process costing.
8. Absorption costing:
   - provides for the establishment of absorption rates;
   - allows for pricing by adding the desirable margin of profit;
   - values stocks according to the financial accounting requirements.
9. Marginal costing:
   - values stocks according to the international accounting requirements;
   - defines the cost margin;
   - allows for profit estimation depending on the volume of sales.
10. Enterprises plan their costs in order to:
    - be able to plan the price for the goods;
    - be able to plan the profit on the goods;
    - be able to control the costs of production;
    - be able to early adjust the production plans.

4. Estimation of full prime cost

4.1. Absorption costing method

In absorption costing the prime cost of goods sold includes all production costs.

The basic principle of such prime cost estimates may be displayed as follows:

Direct material costs
+ Direct labour costs
+ Indirect production costs
=Production prime cost
+ Administration costs
+ Sales and distribution costs
= Full prime cost
+ Profit
+ VAT
= Selling price

Direct material costs are costs associated with the financing of the materials and labour consumed.

Indirect costs or production overheads are costs that are incurred in the course of making a product, providing a service, work of a structural unit or in the course of carrying out certain activities, but which cannot be related directly and in full to a certain cost object. Examples of such types of costs could be as follows:

- materials storage costs;
- indirect materials costs (auxiliary materials, packing etc.);
- indirect salary costs, including social insurance costs (salaries to the unit and production managers);
- cost of premises of production units;
- depreciation of machinery and inventory;
- repairs of production machinery and current interest payments on the inventory capitalised;
- power consumption costs.

There are a lot of different units in a production enterprise with largely varying cost structures. Therefore, in order to obtain more evenly structured cost groups, the indirect costs are split across the various departments. For example, all costs that are attributable to the storage of all raw materials and pre-fabricated goods used in the production are

registered as materials storage costs. The volume of indirect costs is assessed according to the various enterprise operating targets. The targets may be as follows:

- consumption of direct materials (for assessment of materials storage costs);
- number of labour hours / direct salaries;
- number of machine hours (for example, costs of repairing and servicing);
- volume of goods sold (for example, salary bonuses for the goods sold).

Selling costs – the largest share of all selling and distribution costs is constituted by the marketing costs: for example, advertising, distribution costs, selling and administration costs, including also the costs incurred by the sales agents (salary, travelling and accommodation expenses). The largest share of selling and distribution costs are fixed, but a small share of variable costs may also exist. Bonuses for the goods sold can be mentioned as an example. Algas uzņēmuma pārdevējiem bieži vien sastāv no divām daļām: no patstāvīgās (pamatalga) un mainīgās daļas (komisijas nauda).

Administration costs – costs incurred by the enterprise management, for example, activity planning and control etc. costs if they cannot be traced to the process of production or sales of goods. One of the largest accounts in the accounting report is the salary account of the enterprise employees who work in the management accounting and administration departments or in other administrative departments, and of the enterprise management. Administrative expenses may also include the office maintenance costs, including the current interest payments on capitalised administrative offices and warehouse buildings and their amortisation deductions, communication costs, remuneration to contractors etc.

By using the absorption costing method enterprises most often use one of these types of costing:

- absorption costing of full production costs;
- costing of the prime cost of a notional unit;
- overhead absorption costing.

Enterprises may likewise use the hybrids of the above three types of costing, i.e., by combining them. The type of costing is selected by considering which of them best provides with information required on the cost relationships in a specific operation or in the enterprise.

4.2. Absorption costing of production costs

> The total amount of costs directly attributable in the current time period to the volume of output produced, i.e., according to the number of output units produced or following the number of invoiced number of labour hours (enterprise service). The total amount of costs is divided by the volume of the output produced in the result of which the average cost per unit is discovered.

$$\text{Cost of one unit of output} = \frac{\text{Total costs}}{\text{Total volume of output}}$$

Absorption costing method is used in enterprises with a homogenous type of output; for example, only one type of product is manufactured or if the process of production is

homogenous in the enterprise. Such enterprises are processing enterprises (fusion plants, power stations, oil and gas production facilities). These are also the enterprises manufacturing comparatively similar types of products in a homogenous production process or manufacturing the same type of products after a certain period of time. The absorption costing method is also used by the majority of service enterprises.

Example

In 20X1 an enterprise manufactured 1,500,000 metres of textile fabrics. The total annual costs amount to Ls 3,000,000 made up of the following costs:

Direct material costs	Ls 800,000
Direct salary costs	Ls 1,100,000
Indirect production costs	Ls 400,000
Production prime cost	Ls 2,300,000
Selling and administration costs	Ls 700,000
Full prime cost	Ls 3,000,000

$$\text{The average prime cost of one unit of production} = \frac{3\,000\,000}{1\,500\,000} = 2 \text{ Ls/m}$$

The absorption costing may also be more detailed, for example, a share of the enterprise production costs can be split among various production departments. The more detailed the presentation of the cost information is the more valuable is the costing to the enterprise. This could be the information on the variable and fixed costs of the enterprise. The production cost per one metre of fabrics is as follows:

$$\frac{\text{Production prime cost}}{\text{Total volume of output}} = \frac{2\,300\,000}{1\,500\,000} = 1.53 \text{ Ls/m}$$

Selling and administration costs are usually expressed as a percentage rate or the allocation ratio in relation to the total amount of production costs. In this example the ratio for allocation of selling and administrative costs is:

$$\frac{\text{Selling and administration costs}}{\text{Production prime cost}} = \frac{700\,000 * 100}{3\,000\,000} = 23{,}3\%$$

If this enterprise sells its products for a price of 4.00 Ls/m, the profit made is Ls 2.11 per each metre and the total annual profit before tax is Ls 3,165,000.

4.3. Notional unit costing method

This is also referred to as the differentiated process costing method. This type of costing may be applied in enterprises manufacturing several products by using the same production factors and production processes, but where the composition of the product manufacturing factors is different. By introducing the notional unit value the different quantities of various products are assessed in such a manner that the different products manufactured could be expressed in comparable figures – notional units. In

this case the notional unit value is 1. The sum of notional units refers to the total value of the entire output and by dividing the total cost amount by the number of notional units we arrive at the average cost per notional unit. By multiplying this figure by the notional unit value of a certain type of production we obtain the unit cost of this particular product.

Example

In 20X2 an enterprise manufactured 600,000 metres of fabrics A and 1,100,000 metres of fabrics B. In order to produce these goods the same raw materials and production processes are used by adjusting them with minimum changes.

According to the estimates of the enterprise for production of fabrics B 48% of the same raw material that is included in the production of fabrics A are required, 52 % of the direct labour and 75% of the indirect production costs.

Total annual costs amounted to:

Direct material costs	Ls	1 100 000
Direct salary costs	Ls	1 200 000
Indirect production costs	Ls	400 000
Production prime cost		Ls 2,700,000
Selling and administration costs	Ls	600 000
Full prime cost		Ls 3,300,000

The following notional unit values of production factors of the different types of products are given:

Table 4.1

Types of costs	**Notional unit value**		**Period costs, Ls**
	Fabrics A	***Fabrics B***	
Direct material costs	1	0.48	1 100 000
Direct salary costs	1	0.52	1 200 000
Indirect production costs	1	0.75	2 700 000

Table 4.2

Types of costs	**Number of notional units x volume of output (for both types of fabrics)**	**Total notional units, Ls**	**Rate per each notional unit, Ls**

Direct material costs	1* 600 000 + 0.48 * 1 100 000	1 128 000	1 100 000 / 1 128 000 = 0,98
Direct salary costs	1 * 600 000 + 0.52 * 1 100 000	1 172 000	1 200 000 / 1 142 000 = 1,02
Indirect prod. costs	1 * 600 000 + 0.75 * 1 100 000	1 425 000	400 000 / 1 425 000 = 0, 28

The rate of apportionment of the selling and administration costs in relation to the production costs:

$$\frac{600\,000 * 100\%}{2\,700\,000} \approx 22.2\%$$

The costs per each unit of products can be found by multiplying the costs by each rate of notional unit:

Table 4.3

Measures	Fabrics A	Fabrics B
Direct material costs	1 * 0,98 = 0,98 Ls	0.48 * 0.09 = 0.47 Ls
Direct salaries	1 * 1.02 = 1.02 Ls	0.52 * 1.02 = 0.53 Ls
Indirect production costs	1 * 0.28 = 0.28 Ls	0.75 * 0.28 = 0.21 Ls
Production prime cost	**Ls 2.28**	**Ls 1.21**
Selling and administration costs	2.28 * 222 = 0.51 Ls	1.21 * 222 = 0.27 Ls
Full prime cost	**Ls 2.79**	**Ls 1.48**

4.4. Overhead absorption costing

There is one single organisational and cost structure established in large companies, concerns where each of the departments by manufacturing the various types of products or by executing the orders assist each other in increasing of the overall value of the enterprise. Warehouses of materials carry the planning, purchasing and materials storage costs, there is a range of processing (production) costs incurred by the production units, in the units of research and development costs are related to improvement of products and the development of new products, the management accounting and the financial accounting departments bear administrative costs and there are the marketing costs incurred by the sales department.

Therefore in costing these indirect costs should be allocated so that the costs might indicate to which of the individual products or orders these costs are attributable by adding a fair share of the real indirect cots consumption to each of the products.

Departments or structural units incurring the costs are called the points of cost incurring. By allocating the indirect costs to the units, we can obtain an more evenly structured cost groups. The ultimate goal in costing is usually the cost objects or the so called cost drivers. These are what provide the enterprise with the sales revenue and therefore they should also bear a fair portion of the costs.

Overhead absorption costing is a type of costing which in its principle of costing takes account of the differences between the production and cost structures and makes the distinction between the direct and the indirect costs.

Apportionment of costs

Direct costs can be apportioned to individual cost units without any special recording problems. The indirect costs (salaries to the management, lubricants, heating, power, depreciation, administrative personnel costs etc.) are apportioned to the points of incurring on the basis of apportionment by using the general cost absorption rate. These are called overheads. Indirect costs have to be apportioned so that for each of the individual products or orders the share of costs should be attributed which reflects their real consumption of indirect costs. The method for calculation of the overhead absorption rates (apportionment coefficient) is as follows:

- indirect costs are allocated to the departments where they have been incurred;
- following the basis of apportionment of the department the amount of indirect costs for each department is estimated, expressed either in percent or as an overhead cost amount.

Department indirect cost consumption = Department apportionment coefficient
Basis for cost apportionment

Basis for cost apportionment

The basis for apportionment of costs accumulated by the departments can be established based on the different operating targets. The governing concept in the selection of operating targets is if they can best describe and measure the consumption of resources in the departments in respect to the cost object. The basis for cost apportionment should be easily measurable; for the product costing to be as accurate as possible it should be proportionate to the selected operating target. We must also find the cost drivers in each particular department. Such factors may be as follows:

Indirect material costs

- direct material consumption;
- number of kilograms or units supplied and stored in the warehouses;
- how many times materials from warehouses are delivered to the production units.

Indirect production costs

- how many times the machine system is re-adjusted in order to manufacture products of a different quality or to use it for the production of another type of products;
- the number of machine hours consumed in the production department;
- the number of labour hours consumed in the production department;
- costs of direct labour;
- production costs.

Indirect selling and administration costs

- the number of orders placed by the purchasing department;
- number of invoices reviewed;
- number of finished goods despatches.

Procurement department or warehouse (supply and storage of materials)

In the materials department indirect costs are usually calculated by a rate from the consumption of direct materials. Materials storage costs are usually the same regardless of whether cheap or expensive materials are stored, therefore the value of the materials may not always serve as the basis for apportionment of indirect costs. The enterprise, of course, is interested in finding such a basis for apportionment that would assist most precisely in the apportionment of indirect costs.

$$\text{Absorption rate} = \frac{\text{indirect cost consumption in department}}{\text{basis for cost apportionment}} = \frac{\text{materials storage costs} * 100\%}{\text{direct materials usage}}$$

Production departments

Indirect costs of the production departments are usually calculated as an overhead based on the actual consumption of direct labour, work hours or machine hours in the department.

If the activity of a department is based on the work actually performed, indirect costs will be apportioned on the basis of direct salaries or the number of hours spent at work. However, in departments with a high level of automatisation, the number of machine hours consumed should be rather used as the basis for apportionment.

Selling and administration departments

Selling and administration costs are usually calculated as an absorption rate from the production costs.

Overhead absorption costing model

This model shows the calculation of prime cost in an enterprise with two production departments; automated/mechanised production department and assembly department:

Direct material costs
+ Indirect materials storage and supply costs, which are calculated as a rate of direct material costs.
= Total material costs

Direct salaries in the automated production department
+ Indirect production costs in the automated production department, which are calculated as an absorption rate
Full production costs

Total materials costs are the sum of the prime materials costs and indirect materials storage, supply and purchasing costs. These are the total materials costs that are accumulated as of the moment of their delivery to the production department.

Estimation of full prime cost based on the overhead absorption costing therefore includes:

Total material costs
+ Indirect production costs
= Full production costs
+ Production and administration costs, where the absorption rate is usually expressed in percent as the selling and administration costs in relation to the production costs
= Full production prime cost
+ Profit margin
= Selling price without VAT

Example

An enterprise has two production units and the main customer of its products is a chain of department stores. 2. In unit 2 the works are carried out mainly by using the physical labour force. The enterprise has in addition another materials storage and supply unit where the incoming prime materials are controlled and stored. There is also the production and sales department.

The cost information of the enterprise is as follows:

Direct material costs	Ls 2,410,000
Direct salaries	1 960 000
Total direct costs	4 370 000
Salaries to management and administration personnel	600 000
Indirect production material costs	400 000
Power consumption costs	130 000
Repairs and maintenance costs	160 000
Office maintenance costs	220 000
Sales and distribution expenses	260 000
Rent payments	460 000
Depreciation costs	700 000
Total indirect costs	2 930 000

The enterprise is using the overhead absorption costing in its cost calculation and wishes to perform the estimate of the real prime cost amount.

First of all the direct costs have to be allocated between the two enterprise production departments. Then the indirect cost amounts have to be apportioned among the four departments of the enterprise.

From the accounting data it is known that:

Direct salaries In Unit 2	Ls 740,000	Number of machine hours consumed	190,400 hours
Direct salaries In Unit 1	Ls 1,220,000	Number of labour hours used	137,000 hours

Direct salaries costs – Ls 1,960,000.

Table 4.4 Apportionment of the indirect costs among the departments (Ls)

Type of costs	Procure-ment dept	Unit 2	Unit 1	Sales and admin. dept.	Amount of costs
Indirect labour salaries	50 000	170 000	260 000	120 000	600 000
Indirect prod. mat. costs	20 000	146 000	110 000	124 000	400 000
Power consumption costs	10 000	60 000	50 000	10 000	130 000
Repairs and maintenance	8 000	86 000	62 000	4 000	160 000
Office maintenance	4 000	8 000	14 000	194 000	220 000
Sales and distribution costs	-	-	-	260 00	260 000
Rent payments	90 000	130 000	168 000	72 000	460 000
Depreciation	40 000	334 000	212 000	114 000	700 000

Total indirect costs	222 000	934 000	876 000	898 000	2 930 000

In order to prepare the prime cost estimate the overhead absorption rates have to be calculated. The following bases for cost apportionment have been developed in the enterprise:

Procurement dept.:	Indirect materials absorption costs are calculated as a rate in relation to the amount of direct materials consumed.
Unit 2	Indirect costs are calculated as a cash absorption rate in relation to the number of machine hours used.
Unit 1	Indirect costs are calculated as a cash absorption rate in relation to the number of labour hours used.
Sales and administration department:	Indirect costs are calculated as absorption rate in relation to the production costs.

Further these costs are grouped according to the previous method:

Direct material costs	Ls 4,370,000	
+ Indirect material costs	222 000	
Total material costs		4 592 000
+ Direct salaries in the weaving unit	740 000	
+ Indirect costs in the weaving department	934 000	
Costs of Unit 2		1 674 000
Direct salaries in the sowing unit		1 220 000
+ Indirect costs in the sowing department		876 000
1. Costs of Unit 1		2 096 000
Full production prime cost		8 362 000

Then the overhead absorption rates are as follows:

Procurement dept.:	222 000 * 100% / 2 410 000	= 9,2 %
Unit 2	934 000 / 190 400	= 4.91Ls/machine hours
Unit 1	876 000 / 137 000	= 6.39 Ls/ labour hours
Sales/ administration department	898 000 * 100% / 8 362 000	≈ 10.7%

One of the enterprises is specialised in the manufacturing of product A. According to the reports it is seen that the cost of materials necessary for the production of one unit of product A is Ls 12.32. According to the recorded labour timesheet the direct consumption of time per production of one unit of product is 0.7 hours in Unit 2, while in Unit 1 – 1.5 hours. Labour pay – 1.00 Ls/hour

Based on this information the prime cost of one set of products can be estimated as follows:

Direct material costs	Ls	12,32	
+ 9.2% material overheads		Ls	1,14
= Total material costs	Ls	14,04	
Direct labour pay in Unit 2		Ls	0,70
+ Indirect costs in Unit 2	Ls	3,43	
Direct labour pay in Unit 1		Ls	1,50
+ Indirect costs in Unit 1	Ls	9,59	
= Total production costs	Ls 15.22		
Full production prime cost		Ls 21.51	
+ Selling and admin. costs	Ls 1.58		
Full prime cost per unit	Ls 29.26		

Taking into account the prime cost of one unit of production we can approximately determine the price. We have to assume that the enterprise wants to gain profit and will add a profit margin, besides, the VAT amount should be included in the price. Likewise upon pricing the market price has to be considered.

4.5. Questions

1. Describe the terms ‘absorption costing’ and ‘production cost absorption costing’.
2. What is the notional unit absorption costing method?
3. On what occasions the overhead absorption costing method is used? Describe in brief the concept of this method.
4. What methods are used in the apportionment of indirect storage, administrative, procurement costs?

5. Estimation of variable prime costs

5.1. Marginal costing method or the contribution method
5.2. Comparison of absorption costing and marginal costing methods
5.3. Conclusion
5.4. Questions and exercises

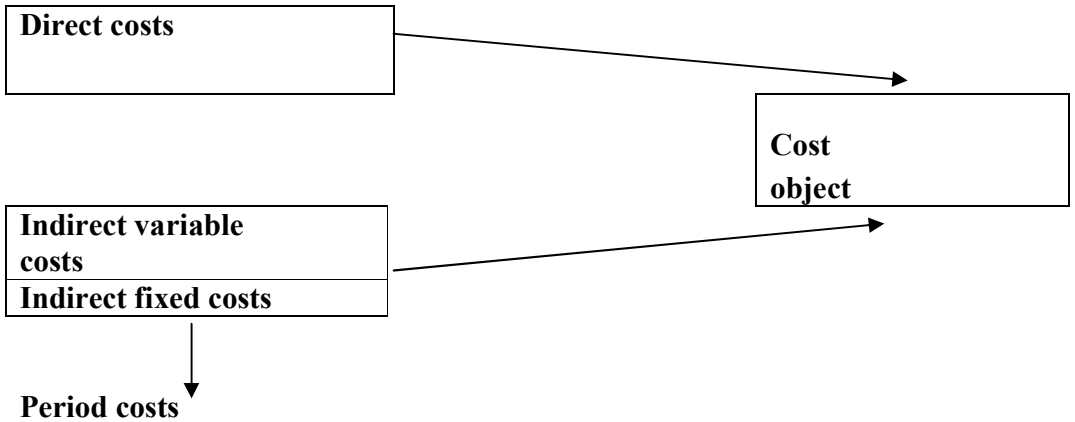
5.1. Marginal costing method or the contribution method

In absorption costing all costs of production or ordering must be taken into account irrespective whether these are variable or fixed costs.

In marginal costing only variable costs are taken into account. Fixed costs are not apportioned among the different types of products or orders, but are recognised as period costs.

Therefore, in application of this method of costing the often complicated apportionment of total costs among departments and individual types of products does not have to be dealt with.

Figure 5.1



The overhead contribution estimate can be presented as follows:

Direct (variable) material costs
+ Direct salaries
+ Indirect production costs
= Minimum production costs
+ Variable selling costs
+ Variable administration costs
= Total minimum costs
+ Contribution
= Selling price

Calculation of contribution is the central concept in marginal accounting. The amount of contribution is the difference between the selling price and the total minimum costs and it has to cover the fixed costs and the profit margin required by the enterprise.
In order to better understand the concept of contribution, the above said can be presented as follows:
Selling price
- Variable costs
= Contribution
- Fixed costs
= Profit

In marginal costing first of all the variable costs of production or order are estimated, i.e., the minimum allowable costs for the type of product or order. Then in order to establish the selling price, the amount of contribution is added to these costs.

The majority of profitability estimates are related with the marginal costing method. This is because a large part of the enterprises must state the prices of their products based on the existing market prices which are often defined following the information from the leading producers of the products in question. If customers do not wish to pay the price set by the enterprise according to the absorption costing method, the enterprise must assess the profitability of the product or order with the help of the marginal costing method.
The enterprise must find the maximum cost limit where the contribution amount covers for all variable costs; the fixed costs exist in the enterprise in any case regardless of whether the order has been received or not. Minimum costs represent the lowest selling price that can be acceptable to the enterprise. Any price that exceeds this cost level starts to cover for the fixed costs and then start generating the profit.
Also in marginal costing the principles of overhead absorption costing can be used, but the estimates made will only provide information on those overheads that cover the variable costs.
Therefore, contribution made by the enterprise products or orders is an amount that must cover in the current period of time the fixed costs plus the profit margin. The basic principle is displayed in Table 5.1

Table 5.1 Marginal costing method

Items	**Cost objects: types of products or orders**	**Total amount**
Sales revenue *less* direct material consumption direct salaries indirect variable costs	Adding the amounts under the relevant items by type of products or orders	Assessing the respective item totals
= Contribution		
less Fixed costs = Profit or loss		

Marginal costing is practically used by all sales enterprises.

5.2. Comparison of absorption costing and marginal costing methods

Table 5.2 Table of comparison

Absorption costing method	Marginal costing method
Enterprises using the absorption costing method believe that the costs in total should be included in the estimates as, for example, the production equipment related costs are as important as variable costs, because it would be impossible to produce goods without these costs, and therefore this production must also cover the pre-defined share of fixed costs.	The followers of marginal costing state that the fixed costs for a period are associated with the enterprise capacity instead of the costs per unit of certain types of products in the relevant period. There is a belief that all fixed costs (for example, the capitalised costs of buildings and enterprise costs, insurance costs, salaries to management etc.) represent costs associated with the readiness of an enterprise to start producing; and such costs exist irrespective of whether an enterprise produces any output in this period or later, and therefore estimates include only variable costs.

It is usual in enterprises that the selling prices of the products may seldom be identified by the absorption costing method alone. The most significant role in the identification of selling price is played by the market and competition relationship and marginal costing must be performed accordingly. However, for enterprises it is important that they are also aware of the marginal costing method. This method is often necessary for gaining more information on the internal situation of the enterprise as well as such estimates can better explain the flow of undesirable production-related costs. Absorption costing may also help in the improvement of the enterprise profitability. The falling prices of products usually force enterprises to seek for new and more efficient processes of production of current products.

However, it is important to understand that an enterprise cannot exist for a long time if contribution cannot cover its fixed costs plus a larger profit margin.

If the enterprise in its pricing policy is guided solely by the additional unit contribution principle being unaware of how much is needed to fully cover the contribution amount that would cover for all of the enterprise costs, the consequences may be the closure of enterprise.

5.3. Conclusion

Upon performance of costing according to both methods it can be seen that each of the methods has its advantages and each of them is used in some specific circumstances.

The absorption costing method is focuses on the system of output production, but does not provide for any orientation in the business market in the area of services. This method is aimed at past events, because the costs and the profit of the preceding periods do not provide information for the long-term strategic planning.

The information assessed with the help of this method is used for the following purposes:

- assessment of costs and profits in order to take decisions on planning and profit control;
- for elimination of stock of finished and unfinished goods at the end of period;
- for pricing.

Costing is used for profit reporting and in financial accounting.

The variable cost or marginal costing method only takes account of the variable costs, therefore special attention must be paid to covering of fixed costs by contribution.

Contribution is largely related with the profitability estimates. This is because a large group of enterprises must take account of the market price by defining the price for its products. Therefore, the marginal costing method is used in the calculation of such a price that would cover for the variable minimum costs, and if this price exceeds this level of costs, it starts covering the fixed costs.

5.4. Questions and exercises

1. What is contribution?
2. For what purposes is the marginal costing method used?
3. Perform the comparison of absorption costing and marginal costing methods
4. Contribution is:
   - profit + fixed costs
   - fixed costs – profit
   - sales revenue – total variable costs of goods sold
   - period opening stock – period closing stock
5. Which of the statements below are correct:
   - if fixed costs exceed the amount of contribution an enterprise bears losses
   - marginal costing realistically assesses the earning capacity of an enterprise
   - the amount of profit estimated according to the marginal costing method depends on the output produced

Exercise 1: estimation of variable costs per unit.

List of costs	**Variable costs**	
	Yes	**No**
- salary to the engineer in the production facility		
- costs of transportation of the materials purchased		
- power		
- machinery adjustment costs		
- variable costs of defective goods		

Exercise 2: Enterprise manufactures product Z, variable costs per 1 unit are Ls 6, selling price – Ls 10.
In September the production output reached 20,000 units.
At the beginning of the month there was no stock of goods for sale.
The total amount of fixed costs per month – Ls 45,000 (production, administrative, selling).

What could be the amount of contribution in September if the output volume would be: 10,000 units, 15,000 units, 20,000 units.

Units:	10000	15000	20000
Production revenues			
Period opening stock			
Variable production costs			
Period closing stock			
Variable costs of goods sold			
Contribution			
Fixed costs			
Profit(+), losses(-)			
Profit/loss per unit			
Contribution per unit			

Exercise 3

Enterprise manufactures product A. As of 1st January there were no stocks of product A.

Variable production costs per unit Ls 10.00
Fixed production costs (annual in total) Ls 80,000
Other fixed costs (annual in total) Ls 60,000
Selling price per unit Ls 3
Normal output level per year 10,000 units

Actual	***Amount of sales***	***Output volume***
I half of the year	3,000 units	8,000 units
II half of the year	7,000 units	2,000 units

What would the profit or loss be in each half of the year by using:

- absorption costing
- marginal costing
- what would the resulting differences be?

Fixed costs are divided into equal amounts for each half year.

Thous. Ls	***I half of the year***	***II half of the year***	***Total***
Absorption costing			
Sales revenue			
Period opening stock			
Full production costs			
Period closing stock			
Production cost of goods sold			
Gross profit			
Production overheads absorbed			
Fixed production costs			
Overhead economy(+)			

Other fixed costs			
Profit			
Marginal costing			
Sales revenue			
Period opening stock			
Variable production costs			
Period closing stock			
Variable costs of goods sold			
Contribution of total production			
Fixed costs			
Profit(+), losses(-)			

6. Stock valuation

Stocks are included in the working capital structure of an enterprise. Stocks are made up of materials purchased for the needs of production, in-house pre-fabricated goods, unfinished products and work in progress, finished products and purchased goods that are intended further for re-selling. The volume of stock cannot be unrestricted; therefore the optimal quantities of stock must be assessed for ordering so that the enterprise assets are not suspended in stock that does not sell for a longer period of time.

Storage facilities and stock management is one of the links of the logistics system. The logistics system is an integrated system which realises the business objectives from suppliers to consumers.

6.1. Selection of the type of storage system

The two types of storage systems are the centralised and de-centralised storage systems.

Under a centralised system one central warehouse is established where the planning, purchasing and storage of all goods takes place.

Under a de-centralised system several warehouses are established for each enterprise unit individually and the planning and purchasing of materials takes place separately in each warehouse.

Both systems have their own advantages and disadvantages.

In a de-centralised system the level of stock rises as every warehouse tries to build-up additional stock for safety reasons.

In a de-centralised system the costs grow up, as several warehouses are necessary and also the orders are placed into smaller quantities making transportation more expensive.

In a de-centralised system the customer servicing time is smaller as the warehouses are located closer to the locations of material consumption.

It is beneficial to introduce a de-centralised system if each area of activities of the enterprise requires different materials and in such circumstances the needs of the specific industry can be served.

However, if the enterprise needs similar materials, it is more beneficial to establish one warehouse where the needs of all departments are collected and therefore the costs incurred in building unnecessary stock levels can be avoided.

6.2. Role of stock and requirement for building of stocks

Stock-building has been criticised a lot recently; there are exceptional occasions, however, when the stocks are necessary.

The need for stocks is determined by several reasons:

- *For improved customer service* Stocks are required to meet customer demand for a certain item of goods within the shortest possible period of time which enables the growth of the enterprise turnover. As the needs of customers vary, it is not possible to predict, how many items of goods will be necessary at any given period of time, therefore an enterprise must hold stocks in the store. There are two reasons for the varying demand: currently there are many goods with a short life cycle, therefore there are no historic data available on past demands; as well as the competition among products is very high – it is possible to assess the demand for a certain group of products, but very difficult to predict the demand for a specific type of product.
- *For reduction of production costs* Although holding of stocks is related to incurring of costs, the stocks, however, allow for an increase in the output and ensure an uninterrupted production process. Holding of stocks enables purchasing into larger quantities by thus reducing the costs of transportation and allows the usage of volume and amount discounts offered by suppliers. Purchasing of stocks helps to avoid the possible effect of inflation; therefore by purchasing the stocks in larger quantities and storing them their price is lower than by purchasing the same stocks at a later period of time. Stocks are important if problems arise with the suppliers; in such situations the enterprise is supported by its reserves while the suppliers get out of their problems or until a new supplier is found.

There are also some reasons why building of stocks would not be desirable or why the level of stocks should be reduced:

- *Stock-building is a way of wasting assets* When stocks are built the enterprise assets, which could be better used for upgrading of production or competitiveness of the enterprise, are suspended.
- *Stocks may be a disguise to the enterprise quality problems* When quality problems arise, the trend is to get rid of the existing stock in order to protect the capital. The elimination process of quality problems can be slow.
- *Stock-building can promote a narrow view of the logistics system as a whole* With the help of stocks it is possible to isolate one step in the system of logistics from another by creating a notion that these steps are not linked, but if there are no stocks or if there are minimum levels of stock, this enables a careful planning and management of the logistics system.

Stock-building or lack of stock-building is linked to the type of business and its strategy regarding the stock of goods; if the business of an enterprise is closely linked with trading in both wholesale and retail business, most probably stocks would be required; if however trading is not the basic business activity or if it is trading within the scope of specific projects or contracts, stock-building can be avoided or the levels of stock can be minimised. Each enterprise must define for itself which strategy should be used.

6.3. Stock accounting and valuation methods

The main objective of accounting for stock is to control the maintenance and correct usage of stocks. Therefore the following information should be available:

- on the receipt, issuance and usage in production or selling of each item of stocks;
- on the employees responsible for storing of each item or quantity of stocks of materials or goods.

This means that the whole accounting for stocks and materials should be organised by the nomenclature items and by the employees in charge for their storage. Concurrently accounting for individual stocks in their places of storage and in financial accounts is established.

Recording of stock in stores is defined as **storekeeping** and this system should be established in an enterprise irrespective of the option of stock accounting chosen in the financial accounting. Stock-keeping records list all types of stock that are used in the production process. They provide records of each specific type of raw materials, components and goods stored in the warehouses or points of sale of an enterprise. Data from stock-keeping records can be used for the preparation of the balance sheet, the income statement and other reports for the needs of financial, tax and management accounting purposes.

Stock turnover and changes in stock balances are recognised in the financial accounts of an enterprise by using one of the following stock-keeping methods:
Stock movement is periodically recorded in the financial accounts and the value of stock balances at the end of each month assessed which is finalised in the current financial year, based on the results of stocktaking (*method of continuous periodic stocktaking*).
Neither any changes in the stock balances nor their usage is recorded during the reporting year, but at the end of the reporting period, based on the results from a stock-take the balance of stocks is set as well as any changes in the stock balances and their usage are estimated and respectively posted (*method of periodic stocktaking*).

Several methods exist also for stock valuation: LIFO, FIFO, and the weighted average cost method.
LIFO – a method of assessing the prime cost of stocks by assuming that the stock of those materials, that were purchased most recently, are consumed before earlier ones.
In the Republic of Latvia only the FIFO and weighted average cost method is allowed.
The FIFO method The FIFO method – (first in, first out) is based on the assumption that the stock of those materials, that were purchased earliest, are sold or consumed in the production process earliest, besides, the actual order of stock usage is not taken into consideration. The FIFO method can be applied in stock-keeping by both the continuous and the periodic stock-taking method.
Weighted average method The weighted average cost assessment method is based on the quantities and values of all units in stock – the existing and those purchased during the period of reporting. The weighted average cost of stock can be estimated for a certain period of time or after each new batch of materials delivery.

In any case an enterprise must apply one of these methods and it is not recommended to switch it individually from one method to the other on a yearly basis. Changing of method is only allowed in special, economically substantiated cases.

In stock-keeping the two valuation options are called:

- the periodic stocktaking method;
- the continuous stocktaking method.

The most significant difference between these two options is as follows:
under the periodic stocktaking method the financial stock accounts remain unaffected during the year of reporting by maintaining the same opening stock balances in cash. Any costs for the purchase of materials and goods are throughout the year of reporting posted to the expense accounts of Group 7, which are immediately written off as costs. At the year end, when performing the stocktake, the balances are valued in the procedure provided by the law (at purchase cost or prime cost).

By applying the continuous stocktaking method in financial accounting the usage of materials is systematically reflected in financial accounts. In order to provide for the above there should be the analytical records of materials available – not only for every item of stock, but also for the batches purchased (quantity, price, total value). Materials consumed are valued pursuant to the prices of purchasing in batches.

There is always a probability that errors may occur in the stock-keeping records upon the receipt of materials and the recording of discounts. In order to avoid such errors in the annual accounts stocktakes are being carried out in the course of which the existing material values are compared to the balances in the financial accounts.

6.4. Stock management

The significance of stock management by decisions coordinated in advance on the stock and transportation policies has been obvious for a long period of time already. Unfortunately, stock management in the framework of the overall system of logistics is complex and affects customer service as well as costs. The complexity involved in the establishment of stock management procedures is interrelated with an efficient strategy of production, issuance and control of stocks, which reduces the costs and improves customer service to be linked with other steps of the logistics system. However, if an enterprise does it successfully, the benefit is huge.

There are two major tasks involved in the management of stocks:

- Forecasting of demand.
- Defining the right moment for stock ordering.

There are several systems available which help to determine these parameters:

- economic order quantity system;
- minimum and maximum level of stock system;
- ‘just-in-time’ system
- others.

6.4.1. Economic order quantity system

The moment of ordering and the optimal amount of order is determined according to the Economic Order Quantity (hereinafter in the text – EOQ) model where stocks are ordered at the moment when their level reaches a certain quantity or at the Reordering Point (hereinafter in the text – ROP).

$$E^2 = 2*P*D/U,$$

where E – the economic order quantity in physical units;
P – stock delivery costs, Ls;
D – average level of demand in physical units;
U – holding costs of stock, Ls.

For example, if the stock delivery costs are Ls 96.00 per month, the average level of demand is 20 units per month and the holding cost of stock is Ls 125.00 per month, then E = 5.54 units.

This means that it is more beneficial to order the required amount of stock in parts instead of ordering all at once as the storage costs of stock are higher than the delivery costs.

EOQ is calculated according to the formula by identifying the balance between delivery costs and storage costs. If a large quantity is ordered, the delivery costs are low, while the storage costs are high. If a small quantity is ordered it has to be done more often which makes the delivery costs higher; the storage costs, however, are being reduced.

ROP has to be set sufficiently high in order for the amount of stock to meet any demand that may arise in the period of time until a new delivery is made.

The advantage of this system is that no concerns arise due to delays in delivery as there are goods in stock, however, as it is difficult to predict the demand, also in this case an enterprise may fall short of stock or, on the contrary, the stock level may be too high which leads again to a cost increase when the goods become obsolete or deteriorate as a result of standing still for too long and have to be written off to losses of an enterprise at cost due to inability to sell them.

6.4.2. Minimum and maximum level of stock system

The minimum and maximum level of stock system (hereinafter in the text – Min-max) is one of the most common systems of stock replenishment. This system is often used in manual accounting systems and sometimes there are cases when such a system is introduced in accounts with the computerised stock control.

The Min-max system represents a periodic stock evaluation activity and the ordering of those stocks with the balance equal to or lower than the minimum level in such amounts that the stock is at the maximum level. This system is aimed at the situation when the ordering and delivery costs compensate for the losses incurred by stock deficit.

$$A = M-K+D,$$

where A – the volume of stock ordering in physical units
M – the maximum level of stock in physical units
K – the current level of stock in physical units
D – expected demand till the moment of delivery in physical units.

For example, if the maximum level of stock is 30 units and there are currently 10 units in the warehouse, while the expected amount at the moment of delivery is 5 units, then the amount of order is 25 units. Therefore, the ordering must be made in such an amount that the level of stock in the warehouse reaches the maximum level.

This formula is used to calculate the ordering quantity of stock, the time interval between each moment of ordering should be defined individually for each enterprise. The expected demand until the moment of delivery is also the minimum stock level.

The minimum level of stock under this system be such that there is no shortage of stock even in the situation when the deliveries are slightly delayed, but the maximum level - such that there is an optimal use of the warehouse area and that there is no excessive stock accumulated.

In application of the min-max system there is a great probability that the maximum level of stock could be too high and the minimum – too low, as it is difficult to state this amount accurately and there isn't either an established system of how to do it, only approximate estimates can be made.

6.4.3. The 'Just-in-time' system

The 'Just-in-time' system of procurement (hereinafter in the text – JIT) comes from Japan where it is called the 'Kanban' system.

This system is based on minimising the holding of stock to reduce the costs. The JIT system requires frequent deliveries and only in the necessary amounts; as well as delivering them at the latest possible time for the moment of consumption. It is important that the suppliers are ready to provide such deliveries as well as that the planning capacity in the enterprise would be such that the orders are placed at the right time by taking into account the requirements of the suppliers about the delivery time and the time necessary for making the order ready for dispatching.

It is easiest to implement such a system if the suppliers also operate according to the JIT system.

The quantities to be ordered and the date when the goods are required is specified upon signing a contract with the customer; upon signing such contracts the orders are placed to suppliers which is the closest possible date to the date of delivery to the customer. Therefore any stocks in warehouse are only accumulated during the intermediate period between these two dates.

The advantage of this system is not only the reduction of costs, but also the confidence that the newest technologies are received and delivered. This advantage is particularly important in the area of IT where technologies become obsolete fast and continuous innovations are introduced.

However, this system implies the risk factor that any of the suppliers may have problems at any time. In the result the deliveries may be delayed which can lead to inability of the enterprise to deliver goods to its customers on time.

Such delays lead to contractual sanctions (payment of penalties) which are outlined at the moment of signing the contract. Penalties are usually defined as a certain interest on the total contractual value for each day of delay. If the delay is too long, the deal can even bring losses to the enterprise, although sanctions on delays in delivery are also imposed upon signing the contract with suppliers which compensates for the losses and reduces the risk slightly.

Therefore, JIT (just-in-time) means that the goods are produced and services provided when they are actually needed – they are unnecessary earlier to be stored as stocks nor after to make the customer wait. Some characteristics of JIT are as follows:

- small ordering batches;
- short re-adjustment period;
- high quality of products;
- *Kanban* card[1].

The purpose of JIT is meeting the immediate demand in a high quality and without unnecessary losses.

JIT is a structured approach in order to improve the overall efficiency and eliminate losses. This system supplies only with the quantity of units of good quality necessary for cost-effective production and delivery, in the right time and place, by using the minimum amount of enterprise capacity, equipment, materials and human resources. JIT depends on the flexibility of balance between suppliers and users. This is achieved by use of such components requiring full participation and team work on behalf of the employees. The basic philosophy of JIT is the streamlining.

Some of the terms describing the approaches similar to JIT are as follows:

- continuous flow production;
- high value added production;
- stockless production;
- high throughput production;
- short cycle production.

You can best understand what makes JIT different from many conventional approaches to production by looking at Figure 6.1. In conventional production (1A) every stage in the production process puts its throughput units as stocks, which separates this stage from the next one. The next stage takes the materials from the stock, processes them and transfers them further to the next of buffering stock. These buffering stocks are intended for making each of the process stages a little bit less dependent on its neighbouring stages. If, for example, stage A interrupts its operations due to some technical reasons, the stage B can continue operating for some time at least and C can operate for even longer as it has two sets of buffering stocks available. The larger the intermediary stock volumes are the more independent are the stages. However, this independence is at the price of a certain amount of stock and a slow production throughput time (therefore also a slow response to customer demand); however, this does not ensure an uninterrupted, and therefore also effective, operation of each stage. If any problems appear in stage A, also stage B will interrupt its operations soon, and some time after it is followed by stage C. The problem incurred and the process of resolving will mainly refer to stage A.

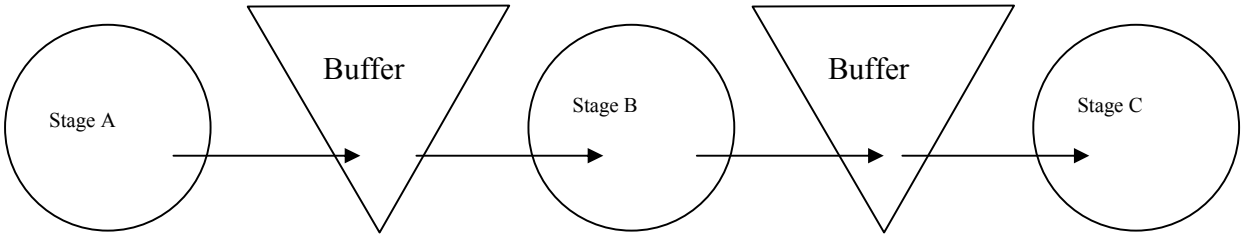
Let us look at Figure 1B. In the case of the displayed JIT system output is manufactured and transferred in a straight way to the next stage of production. If any problems occur in any of the stages, for example, in A, they will soon affect the whole system. Not only the employees of stage A, but also the workers from other stages are going to be involved in resolving the problem. This increases the probability of resolving

[1] *Kanban* is a Japanese term meaning 'card signal' (a card signalising demand). Use of the *Kanban* card denominates the structuring of the production process where each production centre signalises by a card, how many units of output / components are demanded from the previous stage of production or the supplier.

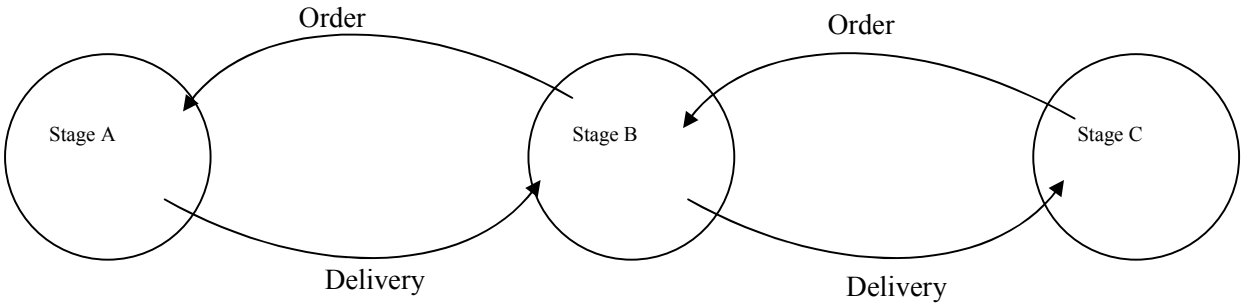
the issue as it is affecting the whole system and attracting the attention of the entire personnel to these problems. By resolving them the general situation in the production facility is improved as time advances. Conventional approaches seek the improvement of efficiency by safeguarding each stage from possible interruptions. In the case of JIT, however, the problems are made more obvious and the 'motivation structure' of the entire system is changed in respect of resolving the problems. JIT sees stock as 'blanket of obscurity' covering the production system and hampering the identification of problems.

In an ideal case JIT requires high standards for all operation performance indicators:

(A) **Traditional approach** – buffering stock is built between each stage



(B) **JIT approach** – deliveries are made after each order



6.1. Figure 2.4 Conventional and JIT flow between stages of production

Quality should be high, as interruptions in the production process due to deviations in quality reduces throughput and therefore the necessity may arise to build stocks so that there are no cut-backs required in the level of output due to low quality products.

Speed, in the sense of a fast throughput of materials in the production process; it is important that the customer demands of are met straight from the production line instead of stock.

Reliability is a pre-condition for a fast throughput, as it is difficult to reach high throughput of materials in the production process if the delivery of spare parts or the equipment is not reliable.

Flexibility is particularly important in order to produce small batches of goods; and therefore to reach high throughput rates and short order execution times.

Even the progressive JIT system, operations that have achieved high level of standards in all performance conditions have been realised on the account of capacity usage (production machinery occupancy). This could be seen already in the previous Figure 1A (buffering stocks in case of a stoppage in one of the production stages provide for the usage of production capacities of the following stages for some period of time). However, high occupancy does not mean yet that the system as a whole will produce more spare parts. Any interruption in the JIT system will also affect other parts of the system, by thus reducing the usage of production capacities for a short period of time, at least. However, the followers of the JIT system provide the argument that output does not matter and does not make the operations in whole to produce the goods for sale, and that it is senseless to continue the production. Actually, the continuation of production only for the sake of the production capacity usage is not only pointless, but even unproductive, as the additional stock produced would only enable fewer improvements. At a given level of demand the capacity usage requirement in the JIT situation would often be lower.

JIT in enterprises

In production enterprises

Let us see, first, how JIT works in production enterprises. There are generally 5 time elements describing the process of manufacturing in a production enterprise:

- Real (the actual processing time) is the time required for the processing of a product of a component;
- Control time – the amount of time taken for the control of each product or component as well as the amount of time used in the prevention of defects;
- Transportation time – the time spent by the products or components in transit between the locations of processing;
- Waiting – the time spent by products and components in transit when waiting in the 'queue' to be processed after they have reached the place of processing;
- Movement time – time which the raw materials and finished products spend in warehouse prior to processing or sale of finished goods and transporting to customers.

From the elements mentioned above only the processing time gives value added to products, while others – incur costs.

The philosophy of JIT not only supports the reduction of the processing time to the minimum level, but also tries to extinguish the other four time elements and other possible elements which do not participate in generating the value added to the product.

Under the JIT system large production rooms where similar types of equipment are held are divided into smaller rooms and the equipment items are placed in production cells which are a kind of mini-factories with several different types of equipment required for the production of one or the other product from the stage of raw materials to the stage of finished products. Also the workers play a great role in the JIT system. In conventional factories the processing specialists are employed, while under the JIT system they have to be taught to service the equipment and are responsible for the changeover process, quality management, repairs and maintenance of equipment.

JIT in trading and service enterprises

If we treat JIT as a kind of philosophy instead of a production system, the basic elements of JIT can also improve operations in trading or service enterprises. Also in the management of such enterprises effort should be made to find the simplest solutions and to avoid unnecessary spending.

By focusing on what provides the value added in the form of larger revenues for the services and goods sold by the enterprise and at the same time by attempting to limit the activities incurring costs, but not generating the value added to goods or services, an enterprise gains the same benefits as production enterprises, i.e., increases the rate of profitability and competitiveness.

Value analysis is a method which is used in both private and public areas. One of its objectives is to cut or avoid the functions the usefulness of which, in respect of the goods produced or services provided by the enterprise, is doubtful, at most. By identifying and analysing the functions it is possible to extinguish or modify those activities that do not affect the quality of goods or services. The enterprise becomes smaller and more efficient in the result.

JIT as a philosophy of operations

There are three basic objectives that describe the basic concept of the JIT philosophy: These requirements are as follows:

- elimination of waste;
- participation of personnel, workers in the operations;
- continuous improvement.

Elimination of waste

Waste can be defined as any activity, operation which does not add value. For example, an unnecessary, non-optimal line of movement of a product only consumes the labour resources, the time and the costs of transportation (fuel for trucks carrying the product from one location of the facility to the other by taking an inadequately long road). Identification of waste is the first step towards its elimination. Toyota discovered seven sources of waste occurrence:

- Overproduction – producing more than immediately demanded by the next process is the largest source of waste, as stated by Toyota. Overproduction delays the flow of production and services by causing stock accumulation and impedes the identification of defects.
- Waiting time – it is well known in many operations that waiting time is a source of waste. Efficiency of machinery and human labour forces are two popular measures widely applied in the assessment of their respective waiting times.
- Transportation – although transportation does not add value to the product, it is often included in operations as ‘granted’ (fuel for trucks carrying the product from one location of the facility to the other by taking an inadequately long road).
- Technological production process – the process itself can become a source of waste. Some operations may exist only because of poor component design or due to poor servicing which can be prevented. Certain technological processes may not be capable of producing items according to the correct specification. Other processes can be unnecessary and odd – these are all waste. For example, in one factory operators had to fold cut-offs from the paper-cutting machine in order to fit them in the transportation platform. Transportation platform was altered in such a way that it

could accommodate the long sheets, thus eliminating the need for unnecessary activities.

- Inventories – according to principles of JIT all inventories become units of disposal.
- Movements – an operator may look busy, because he or she is probably looking for the lost box of instruments. The value added does not exist, in fact. Streamlining of the working process, improvement of the fixtures and fittings and the moulds is a rich potential for elimination of movement waste.
- Incomplete, defective products – waste of quality is often very important in operations, even if the actual quality resources are limited. High rates of cut-offs, waste indicate that costs have been invested in materials and probably also partially in labour of bad quality. Interruptions in the production control system, accelerated operations and errors in delivery are less obvious. Total quality costs are much higher than traditionally believed to be and therefore it is even more important to resist the causes for such costs.

Participation of personnel, workers in the operations

One of the purposes of JIT is to provide policies covering each and every process in an organisation. Corporate culture is believed as to be a key factor in supporting of these policy goals by underlining the importance of personnel involvement. This approach to human resources management is also called the 'respect–for–human' system. This system promotes and often requires team-work in resolving problems, enrichment of work, rotation of workers and wide specialisation.

Techniques of the JIT system

Basic operating practices

– constitute the basic work in the preparation of the organisation and the personnel, and are fundamental in the implementation of JIT;

Discipline – labour standards which are critical for the safety of the organisation participants and the environment, as well as all as one have to follow the compliance with product quality standards.

Flexibility – it could be possible to extend the responsibilities to their ability limits. This is equally attributable to both the managers and the workers. Flexibility barriers like authorisation level structures and limiting practices should destroyed.

Equality – unfair and distinguished personnel policies should be cancelled. In many traditional organisations there are extra benefits allocated to the personnel of different levels of authorisation, for example, parking lots for company cars and canteens. In Japanese companies (even outside Japan) there are corporate outfits, constant remuneration systems in place which does not differ whether the workers work full time or hourly rate workers and the open-design offices.

Autonomy – delegation of increasing amounts of responsibility and functions to employees directly involved in business operations.

Personnel development – the objective to prepare as many such enterprise workers as possible, who would support the strict measures, in order to retain competitiveness. This would provide for more human resources working on the implementation of improvements than in other enterprises on average. It can be partially achieved by the long-term enterprise personnel development programme.

Quality of working life – many JIT principles are included in this category. For example:

- Involvement in decision making;
- Occupational safety;
- Liking and joy;
- Equipment at workplace.

7. Creativity – one of the mostly required elements of motivation. Many of us gain satisfaction not only from the work well-done, but also from improvement for the next time.

In practice, it is difficult to apply all basic operating practices at the same time. For example, certain compromises have to be made between discipline, autonomy and creativity.

Production constructions

– design improvements may considerably reduce the costs of a product (as changes in the number of components and assemblies, better use of materials and processing technologies). Often improvements of such a scope would not be individually possible only by improving the production efficiency.

Focused operations

– simplicity, repeatability and experience of the working operations increases the competence. Focussing in production:

- it should be learned to focus each production facility on a limited scope, easily manageable production, technology and markets;
- it should be learned to structure the basic production policy and the supporting services so, that they are focused only on one precisely stated objective of production instead of several indirect, changing and contradictory objectives.

Small-sized, simple equipment

– several smaller items of equipment are used instead of a single larger equipment. In order to modify the equipment intended for the performance of the main function and the equipment to be more reliable, also internally designed equipment is used, which is easily operable and produce output of good quality. This requires that the competencies of 'in-house' engineers are available and usable, and in the result the equipment would be modified and the new models could be inexpensively launched into production. Small items of equipment are easily transportable by thus achieving the flexibility of layout. Also the risk associated with the making of mistakes in investment decision making is eliminated, as smaller equipment requires lower investments.

Layout and flow

Layout technologies may be applied in order to promote an even flow of materials, information and human resources in the operating environment. The flow is a significant term in JIT. Lengthy routes of technological processes across the factory allow for accumulation of stock, does not add any value to the products and slow down the speed of the materials flow through the production process, which is contradictory to the principles of JIT. The principles of layout suggested by JIT are as follows:

- to arrange the workplaces to be situated closely beside each other so that stock accumulation is avoided;
- to locate the workplaces so that the total group of work stations manufacturing a certain item of components is within the view of each other by making the flow visible for all component parts on the line;

- the use of U lines to enable the personnel to move between the workplaces in order to balance the producing capacity.

Installation time

Installation time can be defined as the time that is required for readjustment of the technological process from the previous batch to the first valid unit of the next batch. Installation times can be reduced by methods like elimination of the time passing while searching for the accessories and tools, by preliminary preparation for the functions that impede the rearrangement and by constant regular installation process activity. Often the relatively simple mechanical changes may considerably reduce the installation time. The second common approach is to transform the work process that was performed before while the equipment was stopped (internal work) into such a work process that can performed while the machinery is working (external work).

Full involvement and participation by people

Full participation by people can only be treated as the extension of the basic work practices. This practice in general implies the undertaking of larger commitments on the part of the personnel in order to use its potential for the overall benefit of the enterprise. They are trained, capable and motivated to undertake full liability in all aspects of their work. They are entrusted with the realisation of these responsibilities in an autonomous way in their own area of specialisation. Activities are expected also on behalf of the personnel.

Transparency and visibility

Any problems, quality assurance projects and operation checklists are visibly displayed by distributing them in such a way that they are transparent and clear to the personnel. For example, display of the tasks to be carried out in the workplace, visual control systems like 'Kanban', open-design workplace arrangements and others.

Disadvantages and benefits of JIT

Weaknesses or shortages of JIT

- Minimum level of the stock of goods or its shortage.
- Increased goods traffic, increased pollution of environment and the public sector needs to invest additional resources in the expansion of the transport network. This means that in case the small delivery amounts cause a situation when the transportation capacity between the production locations is not fully used, then in the result of the implemented JIT principle the traffic of goods increases and the automobile roads and railway lines are congested.
- Not all enterprises are capable of reducing their quantities and delivery terms of stock, which is particularly true for enterprises producing only raw materials as well as for the producers of semi-finished goods as the process of production of prefabricated goods is very long.
- In enterprises operating in the consumer market with branded goods the production process is largely based on production forecasts, and for some products the amount of sales depends on the season.

Traditionally JIT has failures due to one or more of the following reasons:

- Shortage of data about the demand for the real processing time and incorrect (incomplete, inaccurate) estimates. In all successfully operating JIT systems suppliers are able to find out when the goods should be supplied, based on the real

output. Over a longer period of time suppliers must receive complete and accurate sales forecasts.

- Poor quality. Stocks provide a 'blanket of safety', moreover – an expensive 'blanket of safety'. Poor quality is one of the main reasons, why the blanket of safety is required, although, why should any clients accept poor quality products? Suppliers must supply good quality goods and they are paid for that.
- Short-term thinking. JIT represents radical changes in stock management or even their perception. Initially problems are unavoidable in general and many JIT projects are rejected due to initial delays. Well considered systems are created through overcoming less significant problems.
- It is the duty of the material provision function to make sure that suppliers are involved in all aspects of JIT implementation. JIT can operate, but suppliers must fully understand, what is required of them for the system to work. Poor communication, however, or its non-existence have led many JIT systems to failure.

In order to implement the JIT system serious and long-term introduction into the principles of JIT and the development of a program is necessary upon involving the suppliers in the implementation process at a later stage. Starting the operations according to the JIT principles without a comprehensive plan which includes all stages of the supply chain affected, details of implementation and without clear communication, it is clear why enterprises fail. And communication does not mean only the supply of data to suppliers. Suppliers must be informed as far as possible and on as many areas as possible, some of which at first glance may not even seem to be related to JIT.

Benefits that should be obtained from the implementation of the JIT system

- Lower stock maintenance costs;
- Economy of space and costs in factories and at the warehouse;
- Reduced risk of obsolescence;
- Reduced response times to customer orders and reduced delivery times.

In real life JIT does not work as outlined in theoretical publications and books. JIT in theory is often different from JIT in practice. Not all companies are able to inflow stock into their processing activity on a regular basis and to produce their output without interruptions and obstacles. Different industrial branches have different production processes due to several reasons to which JIT cannot be applied. This, however, does not exclude the possibility for those companies to practice JIT – they only need to find a way of adjusting their processes in order to be able to implement as many of the JIT principles as possible.

6.5. Questions

1. Why should an enterprise build-up stocks?
2. What are the two stocktaking methods? Describe them.
3. What methods exist for the valuation of stock balances?
4. Name and describe three stock management methods. Name the advantages and disadvantages of these methods.
5. What are the types of storage systems?
6. Stocks of an enterprise are:
   - goods sold, but not yet paid for

- work in progress at the production facilities
- goods stored under responsibility in other enterprises
- goods for sale

7. Methods for valuation of stock balances are:
   - FIFO
   - LIFO
   - Straight line method
8. Under the FIFO method stocks are written off:
   - according to the costs of earlier (first) delivery
   - according to the costs of the most recent (last) delivery
   - according to the average costs
   - according to the book value
9. Profit of an enterprise depends on:
   - the volume of stocks used
   - the method of stock valuation
   - maintenance costs of stocks

7. Decisions imposed by limiting factors

7.1. 'Make or Buy' decisions

In order to assess the most efficient areas of their business entrepreneurs must often take the decision of whether they should make individual component products or perform some works required by the enterprise with its own internal resources or else buy the components from / outsource the execution of the works to an outside supplier/contractor. Entrepreneurs are usually facing the need to take such decisions in the following cases:

- if due to some factors the volume of output production (service provision) is limited and therefore the level of operations can be increased by purchasing the component products or services from other suppliers;
- if an enterprise has until now been purchasing the component products (services) from other enterprises while its own production capacity has not been used in full, then the issue of producing the same product with its own internal resources should be considered;
- The course of taking the decision is as follows:
- it is identified if there are any limiting factors that restrict the production of the component products in the enterprise and the amount of scarce resources that can be used is assessed;
- it is identified which component products (services) and where can be purchased and at what prices;
- the costs of the component products (services) are assessed on a condition that they are produced with own internal resources;
- the estimated costs are compared to the costs that would be incurred upon buying the products or services, and it is assessed which of the options would generate additional profit or loss;
- it is established, which of the products should be produced in the enterprise, which should be purchased in consideration of the additional costs involved in purchasing.

Example 7.1 An enterprise can by using the same technical equipment produce three components of product Y for sale – A, B and C. One unit of each component is required for the assembly of the finished product. The budgeted demand for product Y is 8,000 units per year. At the beginning of the year there are no stocks of the component products.

Table 7.1 Information about the unit cost of product Y

Component products and works	*Amount of labour used per unit, hours*	*Variable costs, Ls/unit*	Fixed costs, Ls/unit	Total costs *Ls/unit*
A	2	4,00	1,00	6,00
B	1	8,00	2,00	12,00

C	3	6,00	1,50	9,00
Assembly	5	10,00	2,50	15,00
Total:	**11**	**28,00**	**7,00**	**42,00**

The available annual production capacity allows only 40,000 hours to be used. The component parts can be purchased at the following prices (C):

A = Ls 7.00;
B = Ls 14.00;
C = Ls 10.00.

The above given information shows that the prices for all component parts are higher than the costs incurred by producing internally in the enterprise. Therefore, it can be stated that from the point of view of costs it is more beneficial to produce the component parts by the enterprise itself. This is not sufficient, however.

1. It must be found out ***whether the production capacity of the enterprise is sufficient to provide for the production of all the component products***.

Table 7.2 Assessment of the enterprise production capacity

Measures	*Number of units*	*Labour consumption rate hours/unit*	*Total labour consumption, hours*
Products:			
A	8000	2	16000
B	8000	1	8000
C	8000	3	24000
Assembly	8000	5	40000
Required production capacity	X	X	88000
Existing production capacity	X	X	80000
Difference	X	X	-8000

The estimates show the production capacity is a limiting factor as it cannot provide for the necessary 4,000 hours of labour. The assembly labour consumption rate is not taken into account in further estimates as it does not affect the given decision; therefore we assess the producing capacity in hours that can be allowed for the production of component products:

80,000 – 40,000 = 40,000 (hr)

2. Sorting out the priorities As the production capacity of the enterprise is limited, the enterprise will have to buy those component parts, which would contribute least to the growth of the total enterprise costs. Therefore the amount of additional costs incurred by purchasing must be identified per each labour consumption hour for each of the component products.

Assembly costs are disregarded as they are not affected by this decision. As the production capacity of the enterprise does not allow for 8,000 hours required for the production of all component parts, it is more favourable to choose the purchasing of those products for which the additional costs incurred (extra variable costs) per machine hour are lowest.

Let us sort out the list of priorities for the component products.

Table 7.3 Sorting out the priorities

Measures	Component products		
	A	**B**	**C**
Variable costs, Ls/unit	4,00	8,00	6,00
Purchase cost, Ls/unit	7,00	14,00	10,00
Additional costs incurred by the purchase, hours/unit	3,00	6,00	4,00
Labour hour savings by making the purchase, hrs/unit	2	1	3
Extra costs, Ls/hour	1,50	6,00	1,33
Priorities:			
from the point of view of production	2.	1.	3.
from the point of view of purchasing	2.	3.	1.

3. ***The optimal production structure of the component parts must be identified by taking the priority list into account***

Table 7.4 Production structure of component products

Production priority	*Types of component products*	*Labour consumption, hours*	*Number of units*	*Total labour consumption, hours*	*Balance, hrs*
1.	B	1	8000	8000	40000-8000= 32000
2.	A	2	8000	16000	32000-16000=16000
3.	C	3	16000/ 3=5333	16000	16000-16000=0
Total				40000	

The estimates show that in consideration of the priorities and the limited production capacity the needs for component products B and A can be fully satisfied by the enterprise itself, but regarding product C:

- the enterprise can produce 5,333 units with its own internal resources;
- 16,000 – 5,333 = 10,667 units must be purchased.

4. Further the assessment of such business results that can ensure maximum profit in the given conditions has to be carried out.

Table 7.5 Business cost estimate

Measures	*Labour consumption, hrs*	*Number of units*	*Variable costs per unit, Ls/unit*	*Total variable costs, Ls*
Production Product A Product B Product C (in part)	16000 8000 16000	8000 8000 5333	4,00 8,00 6,00	32000,00 64000,00 31998,00

Total production	40000			127998,00
Purchase				
Product C (in part)		10,667	10.00	106670,00
Total variable costs of component products				234668,00
Assembly costs (10.00 * Ls 8,000)				80000,00
Total variable costs, Ls				314668,00

Knowing that the selling price of product Y is Ls 50.00 per unit, we can further estimate (plan) the respective business results.

Table 7.6 Profit estimate

Measures	*Ls*
Revenue from sales of product Y Variable costs Fixed costs	50,00 • 8000 = 400 000,00 314668,00 7,00 • 8000 = 56 000,00
Profit	**29332,00**

7.2. Decision making in conditions of uncertainty

Upon forecasting the interrelation between the volume of sales, revenues, costs and profit, it is difficult to identify the amount of these measures as they may change in the result of the effect caused by internal and external factors. Therefore, it is desirable to use at least two, three possible business performance results (the estimated interval):

- the lowest profit – the pessimistic scenario;
- maximum profit – the optimistic scenario;
- the most probable profit – the most realistic scenario.

Let us illustrate the use of the estimated interval by the following example (see 7.2. Example 7.2).

Example 7.2

An enterprise has found that the probable variable costs related to the production of a product will be Ls 20.00 per unit, the total amount of fixed costs – Ls 1,000,000 and the selling price will be Ls 90 per unit. By using the information made available through a market survey the enterprise has learned that the highest possible level of sales is 20 thous. units, while the lowest – 15 thous. units. By using this information we can estimate the profit gained at the pessimistic and the optimistic volume of sales (see Table 7.7).

Table 7.7 Assessment of the optimistic and the pessimistic profit amount

Measures	*Amount of sales*	
	Pessimistic *15000 units*	*Optimistic 20000 units*
1.Contribution (per unit of production:90 – 20=70), Ls 2. Fixed costs, Ls	1 050 000,00	1 400 000,00

3.Profit, Ls	1 000 000,00 50 000,00	1 000 000,00 40 000,00

It is often the case in the process of business planning and forecasting that it is not possible to determine the total amount of fixed costs and the amount of variable costs with an acceptable degree of accuracy either. In this situation it is desirable to identify the ***margin in percent*** of variable and fixed costs.

1. How large would be the margin of safety of fixed costs in percent if an enterprise wishes to reach the following:

- at least the break-even point;
- the minimum profit of Ls 500.00?

2. What is the safety margin of variable costs in percent if the enterprise wishes to reach the following:

- at least the margin of safety;
- at least the minimum profit of Ls 500.00?

Solution:

1. In order to reach the break-even point by selling 20 thousand units of goods at the price of Ls 90.00 per unit and with the variable costs of Ls 20.00 per unit the fixed costs could grow up to Ls 1,400,000.00 because the estimated profit is Ls 400,000.00 (see Table 7.7)

1,000,000.00 + 400,000.00 = 1,400,000.00 (Ls)

The margin of fixed costs in percent is:

400 000,00 / 1 000 000,00 • 100% = 40%

In order to gain the minimum profit of Ls 50,000.00 the margin of fixed costs could only be Ls 350,000.00.

400,000.00 – 50,000.00 = 350,000.00 (Ls)

Margin of fixed costs in percent:

350 000,00 / 1 000 000,00 • 100% = 35%

2. In order to reach at least the break-even point by selling 20,000 units of product at the price of Ls 90 per unit, given the fixed costs of Ls 1,000,000.00, the variable costs could be by Ls 400,000.00 higher than budgeted or by Ls 20 higher per every unit (400,000.00 / 20,000.00).

Margin of variable costs in percent:

400 000,00 • 100% / (20 *20 000) = 100%

In order to reach the minimum goal, i.e., to gain the profit of Ls 50,000.00 the variable cost margins could be as follows:

400,000.00 – 50,000.00 = 350,000.00 Ls or 350,000.00 / 20,000.00 = 17.50 Ls per unit.

Margin of variable costs in percent:

350 000,00 / 400 000,00 • 100% = 87,5%

Probability is a statement expressed logically or subjectively that an event will occur or that certain conditions will realise. The degree of probability is measured within the limits of 0 and 1, where 0 indicates the impossibility of the outcome,

while 1 – complete realisation of the estimated outcome. The expected value (of the outcome) is calculated by the following formula:

$EV = \sum Rx$,

where EV – expected value;

x – the value of each possible outcome;

R – the probability of the real outcome;

$\sum$ – sign of a sum.

By using this formula, in business we usually establish and choose the option which provides with the highest amount of profit or with the lowest level of costs.

Example 7.3 Enterprise administration has to select one of the two possible options of production and sale of a new product.

Table 7.8 Information on the developed options of new product manufacturing

Project A		*Project B*	
Probability	*Profit, Ls*	*Probability*	*Profit, Ls*
0,4	4 000,00	0,8	2 500,00
0,5	-1 000,00	0,2	1 000,00
0,1	13 000,00		

The outcomes of realisation of each of the projects (the amount of profit) will be:

• Project A 0.4 • 4,000 + 0.5 • (-1,000) + 0.1-13,000 = 1,600 – 500 + 1,300 = 2,400 (Ls)

• Project B 0.8 • 2,500 + 0.2 • 1,000 = 2,000 + 200 = 2,200(Ls)

The estimated results show that the implementation of Project A can provide the enterprise with the maximum results. The lowest possible profit under Project B, however, is Ls 2,500.00, while by using Project A the probability of 50% exists that losses can be incurred in the amount of Ls 1,000.00. Therefore we see that by substantiating the choice solely by the highest value of profit and not taking other factors into account, we increase the business risk.

Example 7.4

The basic condition for decision making is therefore to choose the area of activity with the highest expected value of profit. But, as it can be seen, also other considerations need to be taken into account.

For example, there are two mutually exclusive projects with the probability that the expected profit would be generated as follows:

Table 7.9 Data about projects A and B

Project A		Project B	
Probability	Profit, Ls	Probability	Profit+/losses-
0.8	6 000	0.1	-2000
0.2	5 000	0.2	5000
		0.6	7000
		0.1	8000

The expected value of profit under each of the projects is as follows:
Project A (0.8*6,000)+(0.2*5,000) = 4,800 + 1,000 = Ls 5,800
Project B (0.1*(-2,000))+(0.2*5,000) = 0.6*7,000+(0.1*8,000) = Ls 5,800
Projects A and B have identical values of expected profits; however, the choice of Project A would be more beneficial as there is a probability of 10% under B that losses of Ls 2,000 could be incurred.

In order to illustrate the possible alternative options and their possible outcomes, the graphical representation of decisions or 'decision tree' is used, where:

- branches – the possible decision options;
- smaller branches – the possible outcomes from each decision.

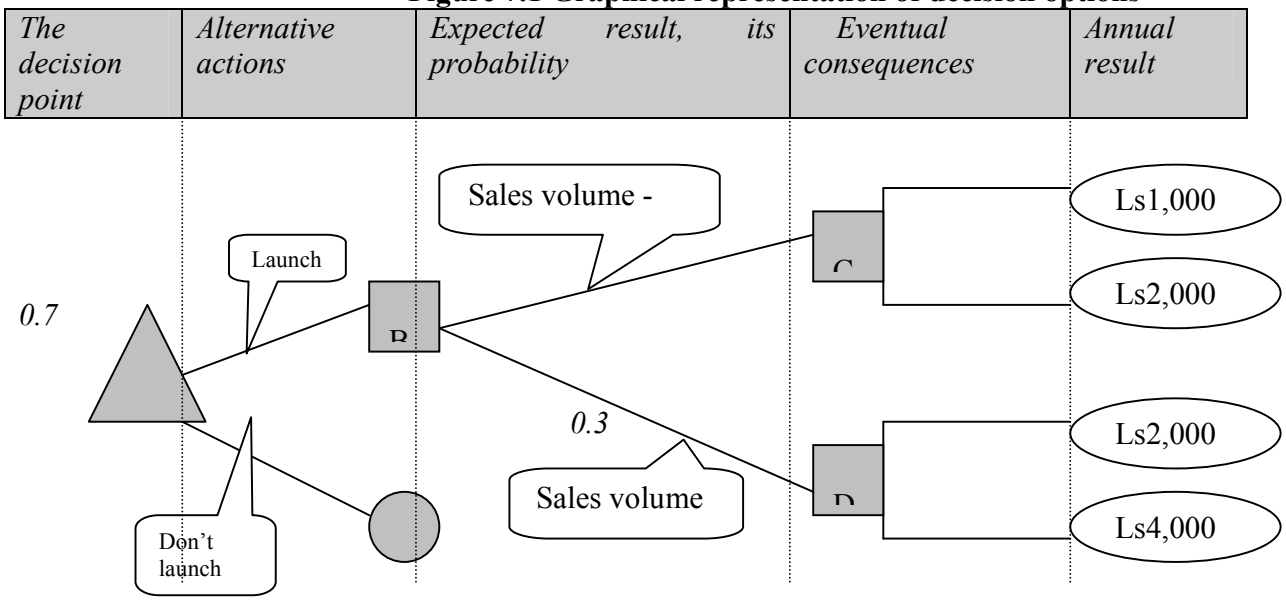
Example 7.5 Enterprise administration needs to adopt the decision on launching the production of a new product X. The estimates related to the manufacturing of this product are given in Table 7.10.

Table 7.10 Expected results from production and sale of Product X

Amount of sales		*Prime cost*	
units	*Probability*	*Ls/unit*	*Probability*
1000	0,7	5,00	0,6
2000	0,3	4,00	0,4

The budgeted selling price of Product X is Ls 6.00. The graphical representation of the decision options is shown in Figure 7.1.

Figure 7.1 Graphical representation of decision options



Symbols used in the graphical display: △ - the decision point; □ - the probable outcome or event point;
⬭ - the final point.

In the final points of the graphical display the amount of expected profit is given, which is assessed as the difference between the expected revenues and costs, for example:
1,000 • 6.0 – 1,000 • 5.0 = 6,000 – 5,000 = 1,000 (Ls)
The degree of uncertainty associated with the decisions to be taken may be reduced by extending the scope and quality of information collection, for example, by carrying out a market survey or experiments.
For the purpose of taking the optimal decision, it is also useful to use the risk analysis data.

As it has been stated before, decision making is often associated with the choice between two or several alternative courses of action.

If the decision has to be made in conditions of uncertainty, when the outcome of none of the courses of activity can be clearly identified, but when the degree of the probable outcome in each case can be assessed, probability analysis may be applied in the decision making process in such situations.

In order to show the corresponding probable outcomes for the decision options, the following is used:

- optional decision statements;
- graphical representation of optional decisions.

The optional decision statements are tables where the probable outcome of each course of action is shown, the profit (loss) value corresponding to each option and the courses of action following each optional decision.

Example 7.6 A hospitality enterprise is preparing to build one more hotel complex with 700 rooms. As the average annual occupancy rate of the existing hotel rooms is 70% it is recommended to build the new complex with 500 rooms only. Estimate the expected value irrespective of the fact whether the rooms are occupied or not, given the cost of Ls 70 per room.

Based on the study of demand for rooms in similar hotel complexes, the following data have been obtained:

Table 7.11 Data from the study of demand

Demand of rooms per day	**Number of days**	**Probability**	**Average price per room, Ls**
800 (high)	216	0.6	100
600 (average)	72	0.2	100
500 (low)	72	0.2	100
	360	**1.0**	

If the complex contained 500 rooms. Revenues per day would amount to Ls 100*500 = Ls 50,000, the costs per day would be 70*500 = Ls 35,000. Profit would amount to Ls 15,000 per day.
600 rooms – profit would be Ls 18,000.
700 rooms – profit would be Ls 21,000.
800 rooms – profit would be Ls 24,000.

The optional decision statement can be prepared from these estimates.

Table 7.12 Profit estimate per day

Profit per day									
		500 rooms		600 rooms		700 rooms		800 rooms	
Demand of rooms per day	Probability(p)	Profit (x) in thous. Ls	EV (px) in thous. Ls	Profit (x) in thous. Ls	EV (px) in thous. Ls	Profit (x) thous. Ls	EV (px) thous. Ls	Profit (x) thous. Ls	EV (px) thous. Ls
500	0.2	15	3.0	8	1.6	1	0.2	-6	-1.2
600	0.2	15	3.0	18	3.6	11	2.2	4	0.8
800	0.6	15	9.0 **15.0**	18	10.8 **16.0**	21	12.6 **15.0**	24	14.4 **14.0**

When adopting the decision the preference should be given to the option with the higher expected value of profit, therefore, the new hotel complex with 600 rooms must be built.

Value of information

The uncertainty associated with the decision making in regard to the expected outcome may sometimes be eliminated by increasing the amount of information collected prior to the adoption of decision.

Information can be obtained from market surveys, reports and inquiries, experimental tests etc. It may be classified as accurate and inaccurate information. The acquisition of both costs money.

Accurate information eliminates doubts and uncertainty. Based on the expected values of the optional decisions the value of accurate information can be assessed.

The value of accurate information is assessed as the difference between expected values of profit.

7.3. Questions

1. Describe the situations when the 'Make or buy' decisions have to be made?
2. Exercise

An enterprise produces two types of products – P and Q.

Data per unit:	P	Q
Direct material costs (Ls per kg)	7	8
Direct labour costs (Ls 5 per hour)	10^	15
Variable overheads	2	3
Total variable costs:	19	26
Selling price	27	35
Demand for the production (units)	3000	5000

The enterprise can use the direct labour hours in the amount of 18,000 hours and materials in the amount of 62,000.

What output production plan would provide with the maximum profit by assuming that the fixed costs per month amount to Ls 50,000 and that there is no stock of goods?

	Materials (kg)	Direct labour hours (hrs)
3,000 units of P require		
5,000 units of Q require		
Total requirement		
Available		
Surplus(+), deficit(-)		
Limiting factor:		

	P	Q
Marginal amount per unit		
Direct labour hours per unit		
Contribution per one hour of direct labour		
List of priorities (in order of cost-effectiveness)		

Priorities/ Type of production	Number of units	Direct labour hours (hrs)	Marginal amount per unit	Total
First -				
Second -				
Total:				
Fixed costs				
Profit				

3. Exercise 'Make or buy' decisions and limiting factors.

An enterprise uses the same production equipment for the production of three components of the primary product – G, H and J. One unit of each component is required for the production of the primary product. The expected demand – 4,000 units. No stocks held. The costs per unit are as follows:

Component	Machine hours (hrs)	Variable costs, Ls	Fixed overheads	Total costs
G	3	20	10	30
H	2	36	20	56
J	4	24	15	39
Assembly		20	15	35
Total:		100	60	160

Only 24,000 machine hours will be available in the budgeted year.
Sub-contractors have set the following component supply prices per unit:
G – Ls 29.00; H – 40.00 ; J – 34.00.
What could be recommended to the enterprise in respect of the choices for manufacturing or purchasing of the primary product components?

	Number of units	**Machine hours**

G		
H		
J		
Total quantity requirement		
Available		
Surplus/deficit		

The limiting factor is as follows:

In lats:	**G**	**H**	**J**
Variable production costs			
Variable purchasing costs			
Extra costs incurred by purchasing			
Machine hour savings by purchasing			
Extra costs per machine hour			
Production priorities list			

Output volume structure corresponding to the optimal budget option:

Production priority	Component	Machine hours per unit	Number of units	Total machine hours available
First				
Second				
Total				

The optimal option for manufacturing or purchasing of components in order to generate maximum profit:

	Machine hours	Number of units	Variable costs per unit	Total variable costs
<u>Manufacture</u>				
Total:				
<u>Purchase</u>	Missing machine hours			
Total variable costs of components				
Assembly costs				
Total variable costs				

8. Cash planning

8.1. Cash budget and cash flow forecasts

The number of enterprises that are recognised as insolvent by the court is growing in Latvia. One of the reasons for insolvency is poor cash management, as the enterprises do not plan their cash flows. In countries of high economic development it is difficult to find a single enterprise where cash flow forecasting is not carried out. Such forecasts are prepared also by efficiently operating businesses, as it helps to minimise the amount of cash required for a timely payment of debts, and to maximise the enterprise income from the use of the existing cash assets. Unfortunately, in Latvia it is difficult to find enterprises which are preparing their cash flow estimates on a regular basis.

When analysing cash flow statements this should be done not only based on the actual previous period data, but also based on the estimated data in order to prepare the cash flow forecast. Forecasting in respect of the inflow and outflow of resources is based on the average figures for the previous periods and the expected rates of growth in sales revenues - the position of cash resources can be forecasted with the help of the budgeted cash flow or forecast.

The cash flow forecast is the expected schedule of all cash receipts and payments. It can be seen from the document, how much cash an enterprise is expecting to receive and how much it plans to spend, and when it happens (at what point in time). If such information is available, the enterprise would be in a better position to identify the expected requirement for extra cash and to assess whether the enterprise would be able to repay the principal and the interest amount on the loan issued to it.

The forecast can be established for every period of time. Short-term forecasts are generally prepared for one month. This period of forecasting is chosen due to the reason of taking into account the seasonal changes in the movement of cash. When cash flows are predictable and at the same time highly fluctuating, cash flow forecasting for very short periods of time can be useful with the purpose of identifying the maximum amount of cash resources required in an enterprise. For the same reason, if an enterprise has a

reasonably steady cash flow schedule, then forecasting of cash flows for a quarter or even for a longer period of time could be substantiated. Usually enterprises prepare their forecasts for two years, besides, cash flows for the first year are presented by each month and in the second year - by quarters or half-year periods. However, it has to be admitted that the longer the period of forecasting the less accurate the estimated results become. At the end of each year the existing cash flow forecast is reviewed and established for the next two years. Forecasts are reviewed more frequently than once in a year if anything unexpected happens in the cash flow forecast. But, however, the longer the period of forecasting the less accurate the estimated results become.

The objective of the cash flow forecast is to estimate the surplus or deficit of cash assets. Effort should be made in an enterprise to prevent the deficit of cash, therefore, a decision must be made on reduction of costs or on increasing the sales.

In order to be able to prepare a forecast the following data must be available:

1) cash revenue amounts by months;
2) payments to be made for different services, materials;
3) other expenses;
4) what investments and loans are planned;
5) any tax payments.

The more detailed this information is the better.

The process of preparing a cash flow can be divided into the following steps:

1) the amount of cash inflow is defined (‘+’);
2) the amount of cash outflow is defined (‘-’);
3) assessment of net cash flow balance as the difference between the amount of cash inflow and outflow. This reflects the movement of cash;
4) assessment of closing cash balances (surplus or deficit).

Cash flow forecasts give an overview about the management future plans, any changes in the future operating strategy. The cash flow forecast of an enterprise describes the possibility of repayment of any loan to be issued.

The question of evaluating the reliability of a cash flow forecast is important. Better overview can be provided by analysing some individual items characteristic of any future cash flows: for example, the business plan and copies of the relevant contracts justifying the forecasted cash flows (on deliveries, sales, leases, crediting, collateral etc. types of contracts) should be evaluated, as well as it needs to be assessed to what extent this information can be relied on in the decision making process. Another point is related to the actual realisation of the cash flows prepared for the previous periods – it should be assessed, whether the forecasts are realistic in relation to the actual results of the preceding year, as well as how accurate the forecasts previously made have been and if it is possible to discover the factors that have caused any variances from the results forecasted (the lack of competence on behalf of the management or any external conditions with minimum possibilities of controlling them). Therefore, the absolute amounts of the variances and their effect on the operating results need to be analysed for the respective period. Also comparison of the information used with the type and trends of any changes in the bank account.

Forecasts usually include certain material elements of uncertainty, therefore some tests should be applied in the evaluation analysis of cash flow forecasts in order to find out, to what extent the forecasts are exposed to the variations in any of these areas of

uncertainty. If the underlying assumptions of the cash flow forecast are questionable it is recommended to perform several exposure control tests, for example, by analysing the variations in the cash requirement in case any problems arise in the collection of accounts receivable within the expected deadline or other unfavourable conditions occur. Likewise the factors that would most probably cause the failure of fulfilment of the forecast prepared by the enterprise should be studied.

Thus, in order to carry out the planned business activities an enterprise needs cash assets. To ensure constant availability of the necessary cash amounts (on a daily, monthly, annual basis) enterprises prepare their cash budgets. When a deficit of cash is expected, it is possible to carry out the corrective measures in a timely manner in order to acquire additional cash assets (for example, to agree with the bank on the issuance of a short-term loan). Similarly – if any surplus of cash is expected, it can be planned ahead how the free cash assets should be invested.

The expected cash receipts and expenses are presented in the cash budget for the budget period.

Enterprises may have one or several sources of cash revenues. For example:

- sale of goods (products, services) on an immediate payment in cash;
- payments from trade debtors (in respect of the sale of goods on credit);
- disposal of fixed assets or selling of securities;
- selling of new (new issue) of shares or debentures, or loans from banks;
- interest and dividends earned through capital investments and participation in the capital of other enterprises (business companies).

It is important to note that all these cash revenues are the cash budget items and may affect the cash cycle, and, however, a part of them affects the profit or loss account and the other affects the balances of the balances sheet items. For example:

- revenues from selling of shares (new issue) or debentures affect the balance sheet;
- income from disposal of fixed assets affects both the balance sheet and the profit or loss account. The profit or loss on disposal of fixed assets, however, are not equivalent to the cash amount received, but are recognised as the difference between cash revenues and the book value of fixed assets written off.

Cash expenses are incurred when one or several payments are made. For example:

- for the purchased raw materials and components;
- disbursement of salaries to employees and payment to other enterprises for the provided services;
- payments made due to capital investments;
- interest, dividend or tax payments.

Not all payments are affecting the profit and loss account. Payments made due to capital investments affect the balance sheet, for example.

It is important to understand that the profit or loss of an enterprise in the period of reporting do not correspond to the difference between revenues and costs for the same period due to the following reasons:

- not all cash receipts are reflected as revenue in the profit and loss account;
- not all cash payments are reflected as costs in the profit and loss account;

- some cost or revenue items in the profit and loss account, for example, due to disposal of fixed assets or depreciation deductions, are recognised based on accounting estimates and not according to the value of revenues or costs;
- there is a time difference between the moment of receiving or paying cash and recognition of revenues or costs. Payment of dividends, for example, can be announced and recognised in the report for the year 20X6, but paid only in 20X7.

In order to ensure sufficient cash available to enterprises for the performance of the scope of activities provided for in the budget plan, it is necessary to prepare the cash budget and to contribute more effort to the budget than to the profit and loss account. The cash budget can be more efficiently used if it is prepared in a way allowing for extending the budget on a regular basis (weekly, monthly, quarterly) with the new next planning period by deleting at the same time the earliest of the previous planning periods from the budget plan. This way the cash budget can be regularly controlled and adjusted in order to always reflect the most recent estimates of any cash receipts, expenses and their balances.

8.2. Cash flow planning

8.2.1. Concept of cash flow

One of the areas of enterprise development is the business development comprising:

- improvement of quality of the products manufactured and the services provided by an enterprise and its competitiveness;
- development of the production processes;
- upgrading of the production equipment;
- raising of the labour force qualification.

For realisation of the above cash assets are required to pay for all the resources involved in the production process. Therefore, two problems acquire significant importance:

- the problem of enterprise financing;
- the problem of optimal usage of the funds invested.

The enterprise financing problem is associated with the identification of the sources of finance which implies financial investing in the enterprise.

The problem of usage of the financial resources occurs in the course of daily operations. It has to be admitted that cash assets serve as an important factor for the enterprise development. In order to ensure a continuous and smooth development, strict control over the movement of cash is required.

Cash flow statement reflects the movement of cash payments which allows for the assessment of the value of cash receipts and expenses as well as the balance of cash assets at the period end. This statement shows if the business presents a positive cash flow, if this cash flow provides for the investment and covers the liabilities, if the enterprise makes investments and if any return on the investments is made or if an enterprise is using any borrowed capital, and if it pays any dividends.

It is also important to evaluate all the factors affecting the movement of cash assets. It is based on the correlation between the component parts of the annual accounts.

There is a technique developed which can be effectively used in the process of management accounting in order to control the deficit or surplus of cash assets.

1. First of all, the profit or loss before tax for the current period must be calculated with the sales costing method.
2. The balance sheet items must be assessed.

3. Cash flows must be analysed (see the table 'Evaluation of factors affecting cash flows')

Table 8.1 Evaluation of factors affecting cash flows

Measures	Notes
1. Profit or loss before tax, +/-	Profit or loss according to the profit and loss account:
2. Changes in stock, %	$C_{net}=S_o-S_c$, where
3. Accounts receivable	C_{net} – net increase or decrease in stocks,
4. Salaries to personnel	S_o – period opening stock balance,
5. Suppliers	S_c – period closing stock balance,
1. Prepaid expenses	$C_d=D_o-D_c$
2. Changes in other accounts payable	$C_{pers}=Pers_c-Pers_o$
3. Changes in equity with the exception of profit for the current year	$C_{supp}=Supp_c-Supp_o$
4. Taxes payable for the reporting year	$C_{tp}=TP_o-TP_c$
	$C_{ec}=EC_c-EC_o$
Short-term cash reserves	According to the P&L
1. Changes in long-term investments	Effect of variances due to all factors
2. Long-term liabilities	$C_{lt}=Lt_o-Lt_c$
Short-term cash reserves	$C_{st}=St_o-St_c$
	Effect of variances due to all factors
Total (general) cash reserve	Effect of both cash reserves

In the result of analysis of the factors affecting cash flows the net cash increase and decrease amount should match the outcome of the total (general) amount of cash reserve.

$$R1 + R2 = CA_c - CA_o,$$

Where R1 – short-term cash reserve;
R2 – long-term cash reserve,
CA_o – period opening balance of cash assets,
CA_c – period closing balance of cash assets.

Example Enterprise X has the following annual report data (see Tables 'Income statement' and 'Enterprise balance sheet'):

Table 8.2 Income statement

Measures	**Year 200X**
1. Net turnover	4000
2. Production cost of goods sold	1810
3. Gross profit or loss	2190
4. Administration expenses	460
5. Interest payments	280
6. Profit or loss before tax	1450
7. Corporate income tax	400
Profit or loss after tax	1050

Table 8.3 Enterprise balance sheet

Assets	**31.12. 200X**	**01.01. 200X**	**Liabilities**	**31.12. 200X**	**01.01. 200X**
1. Long-term investments	° 5920	5650	1. Equity capital 1.1. Equity	7930 5600	6880 5600
1.1. Fixed assets	5920	5650	1.2. Retained earnings	2330	1280
2. Current assets	5592	4280	2. Liabilities	3582	3050
2.1. Stock of goods for sale	1982	1680	2.1. Long-term liabilities	1900	2000
2.2. Accounts receivable	3190	1880	2.2. Other taxes	400	160
2.3. Cash assets	420	720	2.3. Salaries to personnel	282	240
			2.4. Trade accounts payable	1000	650
Total	11512	9930	Total	11512	9930

9.3. It can be seen from Table 9.3 that the cash flow is a negative figure. This means that in the reporting period the amount of cash flow has decreased by Ls 300.00 as it can be seen from the balance sheet – Ls 420.00 at the year end.

Therefore, this analysis provides with the division of the factors influencing the cash flow in two categories. This helps to determine which of the factors affect the cash flow most in both ways positively and adversely.

This may in the result be used as the basis for decision making on issues of development. This analysis plays major role in the management accounting process. It helps to control not only the cash payments, but to also assess the influencing factors of these payments displayed in Table '*Analysis of factors affecting cash flows*':

Table 8.4 Analysis of factors affecting cash flows

Measures	**Outcome**
1. Profit or loss before tax	+1450
2. Changes in stock, %	-302
3. Changes in accounts receivable	-1310
4. Salaries to personnel	+42
5. Suppliers	+350
6. Other taxes	+240
7. Taxes payable for the reporting period	-400
Short-term cash reserves	+70
1. Changes in long-term investments	-270
2. Long-term liabilities	-100
Short-term cash reserves	-370
Total (general) cash reserve	-300

It is seen from the table above that cash amount decreased by Ls 300.00 in the enterprise. This is an adverse fact, but in order to improve the cash flow by undertaking the following measures:

- collecting the accounts receivable on time and minimising the amount of bad and doubtful debts;
- using customer discounts;
- optimising stock;
- postponing investments into fixed assets, intangible assets and financial investment projects;
- disposal of assets with zero returns;
- purchasing more raw materials and services on credit rather than in cash;
- trying to agree on extension of the existing credit terms with creditors;
- trying to receive new credits on more favourable terms;
- ensuring full control over cash flows.

8.2.2. Cash flows by individual business activities

Cash flow is the actual movement of enterprise cash assets in the form of sales revenues and costs – the movement of both cash at hand and in bank (and of its equivalents – high liquidity short-term securities). It is particularly significant as control over the enterprise cash flow is one of the options for avoiding bankruptcy. Cash flow statements provide information on the sources of generating cash as well as information of their usage. Cash flow statements would not reflect those transactions where cash is transformed from one of its forms into another.

Cash flow statement reflects the cash receipts and the expenses of an enterprise by certain types of business activity:

1) operating cash flows;
2) cash flows from investing activities;
3) cash flows from financial activities.

1) Operating activities are the basic business activities of an enterprise recorded in its Articles of Association. Cash flow from operating activities is the main criteria assessing

the capability of the enterprise to operate, to pay for its bills, to pay dividends, to make investments and to raise external financing. Operating activity (as well as the basic or current, or operating activity) is an enterprise activity undertaken with the purpose of profit-making. The operating activity determines what amount of cash has been generated in the course of the current operating cycle, including short-term changes in current accounts. Operating activities are the main source of cash resources ensuring not only the regular, but also the expanded re-generation of the resources consumed. As operating activities represent the basic source of generating the cash receipts and the cash flows, any other enterprise activity is attributable to the operating activity which is not attributable to either investing or financing activities. Usually operating cash flows are the outcomes of any transactions and events that are recognised in the income statement. The following items are attributable to operating activities:

▪ any cash receipts from operating activities, commission fees and other types of income that cannot be attributed to investing or financing operations;

▪ any cash payments made for goods and services, payments to creditors, including also any tax payments;

▪ cash flows from purchases and sale of securities that may be deemed as cash equivalents, are purchased with the purpose of further re-sale and are recognised in financial records as current assets;

▪ any cash expenses incurred for the payment of interest – in the scope of operating activities.

There should be sufficient free cash resources available to make new investments by raising the capital from outside the enterprise (while frequent requirement for smaller amount loans, however, evidence a situation when the enterprise is not capable or raising sufficient cash flows from its operations). By devoting the attention to sales turnover and the income generated, it has to be identified, what determines the growth in sales: larger volumes, higher prices, new customers or sales markets. Attention should be paid to the influence made in the result of debt collection from debtors, the effect of a business credit and stocks on the cost of goods sold, expense accruals and advance payments on selling and distribution overheads and administrative costs, as well as to other movements in the working capital sector. The results of this operating analysis must give the answers to the following questions: how the growth or the lack of growth in an enterprise is affecting the cash requirement for operating purposes and if the production capacity is increasing and at what rates.

2) Cash flow from investing activities is the enterprise cash flow that is related to long-term investments, including also the purchase and sale of securities. The following items are attributable to investing activities:

▪ cash payments for the property bought;

▪ cash advances and credits for termed contracts and options; these refer to the area of contractual rights and stock-exchange transactions;

▪ profit (loss) on disposal of long-term assets is the result of operating activities, but the cash flows from such operations are flows attributable to investing activities.

It is necessary to separately disclose the cash flow from investing activities due to the fact that such assets will generate income in the future.

3) Financial activities are the activities for raising of resources – they are represented by a set of operations resulting in changes in the amount and structure of equity and debt

capital, except for current accounts receivable which are disclosed under cash flows from operating activities. Financing activities include:

▪ cash received in the result of issuing shares and other securities, increasing of equity capital shares as well as the receipt of short-term and long-term loans;

▪ cash expenses incurred in the course of the capital share buy-out, repayment of any credit and loans as well as any debts incurred by the financial lease.

Cash flows by individual types of activity are presented in the table '*Cash flows by individual types of business activity*':

Table 8.5 Cash flows by individual types of business activity

Type of activity	**Cash receipts**	**Cash disbursements**
Operating activities	+ for goods or services sold, + from debtors, + as commission fees or penalties, + taxes reimbursed	- for raw materials, parts, goods and services received, - salaries, - to insurance companies, - for maintenance, - taxes paid
Investing activities	+ on disposal of real estate units, + in the form of dividends, + as interest income, + from disposal of fixed assets and shares held in other enterprises, holdings and short-term securities.	+ for purchase of real estate units, - for buildings constructed, - for construction of fixed assets, - for fixed asset purchases, - for purchase of shares in other enterprises, holdings and securities, which are not cash equivalents, - for purchase of affiliated enterprises, - for issuance of credit and loans to other business entities, - in the form of dividends, - for interest capitalisation.
Financing activities	+ from emission of shares or other interest in equity, or supplementary investments, + as a loan from banks, + as grants, gifts	- as repayment of cash borrowings, - as payments for repurchasing of own shares or interest in capital, - as payments for buyout of leased fixed assets (under financial leasing), - as payment for dividends.

Cash flows are the receipt and consumption of cash resources and their equivalents, the cash cycle shows the outflow and inflow of cash in an enterprise. It is influenced by 2 factors:

▫ Outflow and inflow of cash does not take place concurrent either with the realisation or the moment of reimbursing for the realisation costs. Cash outflow can be delayed by extending the credit repayment term; cash inflow can be delayed by the debtors.

▫ The time difference between the purchase of stocks and their realisation – if stocks are stored for a long period of time, cash does not flow in to the enterprise.

8.3. Cash flow management

The main objective of cash flow management is to ensure the financial balance in an enterprise with the help of balancing the cash receipts with cash disbursements.

Subordinated objectives:

▪ to identify any shortages of cash in a timely manner and to define their reasons,

▪ to assess the amounts of cash required,

▪ to seek the sources of finance and to prevent bankruptcy on time.

The following principles apply in cash flow management:

▫ minimisation of cash amounts held and maximisation of income from cash,

▫ to secure a fast inflow and outflow of cash into and out of an enterprise.

The process of cash flow management consists of the following stages (see the table '*Stages of cash flow management*')

Table 8.6 Stages of cash flow management

1. Provision of a complete and reliable accounting for cash flows and generation of the necessary reports
2. Analysis of the enterprise cash flows for the previous periods
3. Enterprise cash flow optimisation
4. Cash flow planning by different types of activity
5. Provision of performance control of the enterprise cash flows

1. Provision of a complete and reliable accounting for cash flows and generating the necessary reports During the process of this stage the coordination of functions between the enterprise financial accounting service and the financial management is ensured.

2. Analysis of the enterprise cash flows for the previous periods The main purpose of performing this analysis is to identify whether there have been sufficient cash assets, whether these assets have been efficiently used and whether the positive and the negative cash flows have been balanced by their amounts and the timing. Cash flow analysis is performed across the entire enterprise by the individual types of enterprise activities as well as by the structural units of the enterprise.

3. Enterprise cash flow optimisation This optimisation is one of the most important for increasing the cash flow efficiency in the next period of reporting. The most significant objectives of this stage are as follows:

- to discover and to realise the reserves that can diminish the dependence of an enterprise from the external sources of finance;
- to ensure the most optimal balance between the positive and negative cash flows by their amounts and timing;

- increasing the cash flow amount by ensuring the increase from the enterprise operating activities.

4. Cash flow planning by different types of activity

This planning is forecasting by nature due to the high uncertainty of several factors. Therefore, planning of cash flows is realised through the development of various options of estimates for different enterprise development scenarios (the optimistic, the realistic, the pessimistic).

5. Provision of performance control of the enterprise cash flows

This stage comprises the following:

- fulfilment of certain objectives of the plan regarding the establishment of the necessary amounts of cash and usage according to the specified areas of activity;
- establishment of an even cash flow over a certain period of time;
- ensuring the liquidity of cash flows.

8.4. Example of cash flow planning

In order to carry out its business activities an enterprise needs cash assets. To provide for the necessary cash in a sufficient amount on time cash budgets are being prepared, i.e., cash flow (turnover) forecasts are made.

In the course of forecasting the ability of an enterprise to generate cash and its equivalents (cash balances in bank accounts, short-term deposits, highly liquid securities) may be assessed. The cash flow forecast shows when and in what amounts an enterprise will have any cash receipts, how much and how it will spend it, when any cash deficit can be expected or – any cash surplus.

Therefore, it is possible to early perform any measures in order to raise the additional amount of cash required, for example, receive a short-term bank loan.

If any cash surplus is expected, a timely decision can be made on rational utilisation of the free cash assets.

It is significant to remember that ***the profit or loss of an enterprise for the budget period usually do not correspond to the difference between cash receipts and cash payments of the same period***, as many cost items included in the budgeted profit or loss account are unrelated to the budgeted payments within a certain calendar period of time which are planned in the cash flow forecast for the same period, for example:

- ✓ materials that will be used can be purchased and paid several months before usage and recognition in the budgeted profit or loss account;
- ✓ upon purchasing any fixed assets the amount of payment associated with their purchase will be reflected in the expense section of the cash flow forecast, while in the budgeted profit or loss account only the fixed asset depreciation amount will be recognised in the respective period.

Upon developing the cash flow forecast higher efficiency may be achieved by using ***the continuous or rolling budget planning method***. By using this method the budgeted cash flow is regularly (on a weekly, monthly, quarterly basis) reviewed and a new future period is added to the forecast. In this way the cash flow forecast is constantly controlled and revised in view of the actual deviations occurring as a result of the impact of various factors.

Figure 8.1 Cash flow forecast (budget) for year 20XX

Measures	**January**		**February**		**March**		**Quarter 1**		**…**		**Year 20XX**	
	fore cast	actual	fore cast	actual	fore cast	actu al	forecas t	actual			forecas t	actual
A. Opening cash balance for the period												
Revenues												
- capital invested by the owners; - sales revenue; - external (loan) capital; - %, dividends; - other receipts (to be listed)												
B. Total receipts												
Expenses												
- purchase of fixed assets; - purchases of materials; - salary payments to personnel; - tax payments; - interest payments; - other payments (to be listed)												
C. Total expenses												
D. Balance of cash assets (A+B-C) for the period												

Example Preparing the cash flow forecast and the budgeted profit or loss account

The enterprise has the possibility to increase its sales turnover by Ls 30,000 per week.

The enterprise offers its customers a 3 week sales credit, while it pays its vendors in two weeks time upon delivery.

The amount of materials requirement is Ls 85,000 per month.

In Week 1 a purchase of machinery for Ls 16,000 is planned on credit payable weekly in two months.

Personnel costs will rise by Ls 900 per month. The enterprise pays salaries to its employees twice a month (in Week 1 and Week 3).

Repayment of a bank loan taken earlier requires a monthly principal amount of Ls 1,200 and an interest amount of Ls 90 to be executed in Week 1.

Rent payments – Ls 200 per month (payable in Week 2); also the payment of Ls 400 for an advertisement to be published next year has to be made in Week 2.

1. Prepare a cash flow forecast for two months and identify the amount of loan (overdraft) requirement as well as state the loan repayment date.
2. Prepare a budgeted profit or loss account for Month 1.

Solution

1. Cash flow forecast for two months

Item	**1. W1**	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**
Cash receipt from sales of goods	-	-	-	30000	30000	30000	30000	30000
Cash expenses for deliveries of materials	-	-	21250	21250	21250	21250	21250	21250
Cash expenses for purchase of machinery	2000	2000	2000	2000	2000	2000	2000	2000
Cash expenses for salary payments	450	-	450	-	450	-	450	-
Cash expenses for repayment of the loan	1200	-	-	-	1200	-	-	-
Cash expenses for payment of loan interest	90	-	-	-	90	-	-	-
Cash expenses for payment of rent	-	200	-	-	-	200	-	-
Advertising cash expenses	-	400	-	-	-	-	-	-
Net cash receipts/expenses	-3740	-2600	-23700	6750	5010	6550	6300	6750

As we see from above total ***cash*** receipts and expenses of an enterprise are presented in the cash flow forecast.

The loan requirement is Ls 30,040 (3,740+2,600+23,700=30,040), besides, it must certainly be a short-term loan, as the net positive cash balance since Week 4 is Ls 31,360.

2. Budgeted profit or loss account for the first month

Sales and expenses are in the meaning of accounting disclosed in the profit/loss account.

Item	**Amount**
Sales revenue	30000*4=120000
Expenses for deliveries of materials	85000
Salaries paid	900
Loan interest paid	90
Rent paid	200
Profit	33810

As it is seen from the profit or loss account, the profit made by the enterprise after implementing the project is Ls 33,810 already in Month 1, while its cash flow statement shows a cash deficit, which means that, as in the first weeks the outgoing cash flow exceeds the incoming cash flow, the enterprise should apply for a short-term loan.

This clearly illustrates the differences between cash receipts and cash payments and sales revenue and expenses in the meaning of accounting.

8.5. Variances from the budgeted cash flow

The cash flow budget prepared for one year or month, one week or even one day only shows the estimated cash flow. Even the best planned estimates will not be fully accurate. Therefore variances between the actual data and those provided in the budget are inevitable.

When preparing the budgeted cash flow in conditions of uncertainty, it is necessary to use probability analysis. Therefore, it is desirable to develop several options of budgeted cash flows based on various assumptions on the amount of sales, costs, payment schedule, doubtful customer debts etc.

When planning different probabilities the management should forecast the measures that would be taken in the case of any unexpected circumstances, as well as to assess the influence of the main budget factor.

Based on the probability analysis data about the possible outcome of each cash item, management is able to state with a higher degree of accuracy:

- the minimum cash balance;
- the necessary loan amount in order to ensure a sufficient amount of cash reserve. As it is very complicated to finance any unexpected cash deficit amounts at a short notice, this type of highly flexible planning is also desirable for reaching of a timely agreement with the bank on issuing of a short-term loan.

8.6. Cash flow statement and methods of presentation

8.6.1. Terms used in cash flow statements

Cash flow statement is an integral part of the financial report which reports the flow of cash and its equivalents for during the period classified by cash flows from operating, investing and financing activities.

Cash (in accordance with the Latvian Accounting Standard no 2) is cash on hand and in demand deposits.

Cash equivalents (according to the Latvian Accounting Standard no 2) are short-term, highly liquid investments that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value. In order to consider an investment a cash equivalent it should be readily convertible in cash and the risk that the value of investment will change must be insignificant. Normally an investment are considered as a cash equivalent only if its maturity date does not exceed three months from the acquisition date. Cash equivalents may be, for example, termed bank deposits or

loans. Investments in shares cannot be considered as cash equivalents, except investments in preference shares with a certain term, if, from the date of their acquisition their term of repurchasing does not exceed three months.

The objective for preparing a cash flow statement is to illustrate that over a certain period of time an enterprise will generate cash revenues and incur cash expenses by indicating the main sources.

The goals of preparing a cash flow statement is to provide the owners of an enterprise the possibility to plan the activities of their enterprise more precisely and to obtain a more complete overview of the cash receipts and expenses over a longer period of time, as well as to demonstrate to external investors in what period of time and how it will be possible to recover their resources invested.

Only the amounts received and paid in cash and their equivalents (hereinafter – cash) are presented in the cash flow statement. ***The statement does not include any transactions that are not related with cash flows***, for example, asset takeover as a security for any outstanding loans, asset takeover together with the takeover of the relevant liabilities, transformation of liabilities into capital and reserves.

When preparing the cash flow statement for the year 2004 and further, the Latvian Accounting Standard no 2 'Cash Flow Statement' will be applicable, the requirements of which are statutory provisions pursuant to the Cabinet of Ministers Regulations no 728 'Regulations on statutory Latvian accounting standards and the procedure for preparing cash flow statements and statements on changes in equity'.

Latvian Accounting Standards are comprehensive and repeatedly applicable guidelines for the recognition, evaluation and disclosure of financial items that are consistent with the governing accounting laws and regulations, laws of the European Communities and the International Accounting Standards.

The Latvian Accounting Standard no 2 'Cash flow statement' (hereinafter – 'the standard') lays down the

- structure,
- contents,
- procedure of establishing,
- information to be disclosed about the changes in enterprise cash flows for the reporting period in order for the users of financial statements to be able, based on the cash flow statement, to evaluate the cash generating capacity of an enterprise as well as to predict the schedule, sources, usage and stability of such cash flows.

The standard applies to enterprise cash flow statements and consolidated cash flow statements prepared in accordance with the provisions of the Law on Enterprise Annual Reports or the Law on Consolidated Annual Reports.

Terms used in the standard:

- ***working capital*** *(current capital)* is the part of an enterprise capital intended for use in the operations of an enterprise and consisting of current assets less short-term liabilities;
- ***financing activity*** is an activity that results in changes in the size and composition of the equity capital and the borrowings;
- ***investing (investment) activity*** is the acquisition and disposal of long-term assets and other investments not included in cash equivalents;

- ***cash flow*** is an increase and a decrease in cash and cash equivalents;
- ***operating activity*** is the principal revenue-producing activity of the enterprise and other activities that are not related with investing or financing activities;

In cash flow statements the cash flow for the reporting period is presented, by individually disclosing the cash flow from

- operating activities;
- investing activities;
- financing activities.

Cash flow statement consists only of the cash payments actually received or executed (with the respective VAT amounts).

The cash flows associated with extraordinary items should be presented as arising from operating, investing or financing activities as appropriate and disclosed separately from other items of the cash flow statement, for the users of the financial report to easier understand them and to assess their impact on the enterprise cash flow for the reporting period and any future periods.

Some transactions may be related to several cash flows to be disclosed separately in the cash flow statement.

For example, any interest payments related with the repayment of loans can be disclosed as operating or financing activity cash flows, while repayment of the principal amount of the loan is reported as the cash flow from financing activities.

8.6.2. Cash flow from operations

Cash flow from operating activities is mainly incurred in the result of the revenue-producing activities of the enterprise. Usually this cash flow is incurred by those items which determine the net profit or loss of the enterprise. Examples of cash flows from operating activities are the following items of cash and cash equivalents:

- cash receipts from the sale of goods and the rendering of services;
- cash receipts from copyrights, commission fees and other revenue;
- cash payments to suppliers for goods and services;
- cash payments to and on behalf of employees;
- cash payments for taxes on real estate units;
- cash payments or receipts related to the corporate income tax.

Certain transactions may affect the net profit or loss of an enterprise, although they do not necessarily relate to operational cash flows. For example, cash flows from disposal of fixed assts shall be classified as cash flow from an investing activity.

If an enterprise has purchased ***securities with the intention of further re-sale***, these assets are disclosed similar to stock of goods and the cash flows from their purchasing and sale are reported as operational cash flows.

Cash flows from operating activities are reported using either:

- *the direct method*, i.e., whereby gross cash receipts and gross cash payments are disclosed with the breakdown by major classes; or
- *the indirect method*, i.e., whereby net profit or loss before extraordinary items is adjusted for the effects of transactions of non-cash nature, any deferrals or accruals of

operating cash receipts or payments, and items of income or expense associated with investing or financing cash flows.

When using ***the direct method***, the information on the major classes of gross cash receipts and gross cash payments can be obtained from:

- the information from the enterprise accounting records;
- by adjusting the net turnover, the production costs of services rendered or goods sold and other items of the income statement for:
  - changes in the balances of stocks and non-operating accounts receivable and other liabilities for the reporting period;
  - balances of other items of non-cash nature;
  - balances of other items related to cash flows from investing activities and financing activities.

Under ***the indirect method*** net cash flow from operating activities can be obtained by adjusting the net profit or loss before extraordinary items for:

- changes in the balances of stocks and non-operating accounts receivable and other liabilities for the reporting period;
- balances of non-cash items, for example, depreciation, provisions, deferred taxes, unrealised profits/losses from fluctuations in currency exchange rates, retained earnings of associated enterprises and minority interest;
- balances of other items related to cash flows from investing activities and financing activities.

8.6.3. Cash flow from investing activities

Cash flow from investing activities, which is disclosed separately in the cash flow statement, ***provides an overview to the users of the statement on acquisition of assets intended for generating future profit and cash flows***.

Examples of cash flows arising from investing activities are cash and its equivalents paid or received for the following items:

- property, plant and equipment (including the fixed assets developed and produced in-house), intangible and other long-term investments;
- debentures and shares in other enterprises (except those reported in the cash flow statement as cash equivalents, as well as those acquired for further re-sale);
- loans made to other parties;
- derived financial instruments, for example, futures and forwards, options, swaps, except in cases when these financial instruments are acquired for further re-sale or when the payments received in relation to these instruments are reported as cash flows from financing activities.

If an enterprise has entered into a contract which has been recognised in accounting as a ***hedge for any open positions or financial report items***, the cash flows related to this particular contract is reported by the enterprise in the same way as the cash flow related to the respective open position or financial report item.

The major classes of gross cash receipts or payments from investing activities are reported separately except in cases when the respective cash flow is disclosed as ***net cash flow*** as specified in the standard.

8.6.4. Cash flow from financing activities

Cash flow from financing activities, which is disclosed separately in the cash flow statement, ***provides the information to the statement users about the share of cash claimed by the capital providers from future cash flows of the enterprise***.

Examples of cash flows from financing activities are the following items of cash and cash equivalents:

- received from issuing of the enterprise shares or other equity capital instruments;
- paid to owners to acquire or redeem the enterprise's shares;
- received from issuing debentures, discounted bonds, mortgages and other short-term and long-term loans;
- repayments of amounts borrowed. Also the payments made toward the redemption of any liabilities under financial leases are disclosed by the lessee as cash flows from financing activities.

Any government aid received (for example, ***subsidies, grants***) and other similar financial aid intended for the funding of long-term investments must be reported as cash flows from financing activities. Grants and subsidies received with the purpose of compensating for any operating or other costs which are not related to long-term investments (for example, for carriage of passengers, interest costs in relation to procurement of grain, loss of profits in the result of natural calamities) are reported with the cash flow of the relevant type of costs.

The major classes of gross cash receipts or payments from financing activities are reported separately, except in cases, when the respective cash flow is disclosed as ***net cash flow*** as specified in the standard.

Reporting of net cash flows

Cash flows from operating, investing and financing activities are reported as ***net cash flows in the following cases***:

- cash receipts and payments were made on behalf of a customer and this cash flow is rather related to the operating activities of the customer than of the enterprise. *Examples* of cash flows:
  - collection of rent payments on behalf of owner and debt settlement with the owner;
  - cash collection and payments to suppliers of consignment goods.
- the amount of cash receipt or payment is attributable to asset or liability items with high turnover, large amounts and short liability redemption or payment period. *Examples* of cash flows:
  - purchasing and selling of securities;
  - receiving and repayment of loans with the repayment term not exceeding three months.

Foreign currency cash flows

Cash flows related to transactions in foreign currencies are reported in lats at the Bank of Latvia rate of exchange effective as of the transaction date.

Cash flows of any subsidiaries based abroad are reported in lats at the Bank of Latvia foreign exchange currency rate effective as of the date of the cash flow, which has been defined based on the Bank of Latvia foreign exchange currency rate in the respective period.

Upon reporting the cash flow of a subsidiary based abroad in the consolidated cash flow statement in lats the holding enterprise cannot use the foreign exchange currency revaluation rate effective at the end of the reporting period.

Profit or loss incurred in the result of foreign currency changes shall not be considered as cash flow. However, for the purposes of reconciling cash and its equivalents at the beginning and at the end of the reporting period, ***the effect of any changes in the foreign currency exchange rates*** on cash and its equivalents in foreign currency should be reported in the cash flow statement. This effect ***is disclosed separately from the cash flow arising in the result of operating, investing and financing transactions in a special line before the net increase or decrease in cash and cash equivalents***.

The amount of any loans repaid or received is reported included in the amount actually paid. If cash flows from operating activities are reported by using the indirect method, any adjustments for changes in foreign currency exchange rates that are related to revaluation of this loan borrowed or issued must be disclosed.

Interest and dividends

Cash flows from interest and dividends received and paid should each be disclosed separately. Each of these cash flows should be classified in a consistent manner from period to period as operating, investing or financing activities.

The total amount of interest paid during the reporting period should be reported in the cash flow statement irrespective of whether this amount is recognised in the profit or loss account or reported in the balance sheet.

Any interest paid is reported by enterprises as cash flow from operating or financing activities, and any interest received – as cash flows from either operating or investing activities.

Any dividends paid are reported by enterprises as cash flow from operating or financing activities, and any dividends received – as cash flows from either operating or investing activities.

Corporate income tax

Cash flows arising from taxes on income should be separately disclosed and should be classified as cash flows from operating activities.

Also the corporate tax payments made abroad should be included in this class. The amount of corporate income tax paid abroad should be disclosed in a special note to the financial report.

Any corporate tax payments withheld from payments made to other enterprises and then transferred to the state budget, for example, in transactions with non-resident

entities, should not be classified as enterprise's own tax payments, but rather added to the respective cash flow on which the tax has been withheld.

Investments in subsidiaries, associated enterprises and joint venture enterprises

Only those payments should be reported in the cash flow statements (for example, dividend payments) that are made between enterprises, that are accounting for their interest in a subsidiary or an associated enterprise according to the acquisition cost method or the equity method, and the respective subsidiary or associated enterprise.

Enterprises reporting their participation in a joint venture in accordance with the equity method, must report any cash flows form investment in the joint venture and other payments made between the enterprise and the joint venture (for example, any cash receipts from sales of goods produced by the joint venture or from distribution of profit due to the enterprise pursuant to the foundation agreement) in the cash flow statement.

Enterprises reporting their participation in a joint venture in accordance with the proportional consolidation method, must report its proportion of the joint venture cash flows in the consolidated cash flow statement.

Purchase and acquisition of enterprises

Total cash flows from purchase or acquisition of enterprises should be classified separately in the cash flow statement as cash flows from investing activities.

If an enterprise has purchased or acquired another enterprise in the reporting period, the following should be disclosed in a separate note to the financial report:

- total purchase cost or total compensation value;
- the share of purchase cost or the share of compensation value paid or received in cash and its equivalents;
- amount of cash and its equivalents held in the enterprise purchased or acquired;
- assets and liabilities of non-cash nature in the enterprise purchased or acquired classified as a separate group of balance sheet items.

Enterprises should separately classify in the cash flow statement the cash flows from purchase or acquisition of another enterprise for the financial report users to distinguish this cash flow from other cash flows from operating, investing and financing activities. In the period of reporting enterprises should in the cash flow statement classify the cash flows arising in the result of enterprise acquisition from cash flows arising in the result of purchase of another enterprise. Enterprises should in a note to the financial report give a separate explanation regarding any assets or liabilities purchased or acquired.

Total amount of compensation paid or received for the purchase or acquisition of another enterprise should be disclosed in the cash flow statement net of any cash or cash equivalents of the enterprise purchased or acquired.

Transactions of non-cash nature

Investing and financial transactions of non-cash nature are not reported in the cash flow statement. Any information on such transactions is disclosed in a note to the financial report.

Many transactions arising in the result of investing and financing activities do not affect the cash flow for the period reported although the structure of enterprise's equity capital and assets are changed in the result of such transactions. Examples of such transactions of non-cash nature are as follows:

- acquisition of assets arising from the increase in the enterprise liabilities (either directly or through financial leases);
- acquisition of interest in another enterprise by performing an issue of own enterprise shares;
- acquisition of shares or capital interest through investing property;
- debt capitalisation.

Other explanations

In addition to the information defined by the Law on Enterprise Annual Reports and under other paragraphs of this standard an enterprise must disclose the following information in a note to the financial report:

- details of composition of cash and its equivalents as well as the balance of cash and cash equivalents disclosed in the cash flow statement by reconciling it with the amounts disclosed in balance sheet item 'Cash' and substantiating any differences, if applicable;
- the policy for definition of the composition of cash and cash equivalents pursuant to the requirements of the Latvian Accounting Standard no 1 'Basic guidelines for preparation of financial report';
- details of the most significant amounts of cash and cash equivalents the use of which is encumbered; The use of cash and cash equivalents is considered as encumbered if, for example, the concern is not in the position to dispose of the cash and cash equivalents of any enterprises that it holds and that is based abroad, based on effective currency exchange arrangements or other legal restrictions.

Cash flow statements are prepared based on the ***layouts*** specified in the standard and in compliance with the following conditions:

- the classes are disclosed separately in the order provided in the layout;
- in layouts the classes denominated by Arabic digits can be further broken down, new classes may be added if appropriate and they may be also merged if the amounts of the individual classes are immaterial or if such merging of classes gives more clarity;
- for each class the respective data of the previous periods should be disclosed. If these data are unavailable it should be disclosed in a note;
- the layout of the cash flow statement should be changed in the next year only if there are special circumstances for such a change and if the statement has been prepared according to one and the same layout for two consecutive years at least; The reason for the change should be disclosed in a note to the financial report;
- any classes without figures should only be disclosed if it contained any figures in the preceding period of reporting.

Conclusion

Cash budgets illustrate the expected cash receipt and expense estimates and therefore it is an important management control instrument.

The procedure for preparing a cash budget is as follows:

- the cash budget planning schedule is established with a breakdown by period;
- estimates about payments of trade debtors (trade accounts receivable) are made;
- other revenues are identified;
- estimates of any cash payments to suppliers are made;
- other payments are identified;

Enterprise managers require cash budgets for the control of cash turnover and for the performance of realistic measures for prevention of cash deficit, and if any shortages of cash are expected. With the use of computer technologies specific data models are used in the preparation of cash budgets.

8.7. Questions

1. What is the objective of preparing cash flow statements?
   a. provision of information on investing and financing operations in the period reported
   b. confirmation of the fact that revenues exceed expenses if net profit is generated
   c. provision of information on all cash receipts and payments in the period reported
   d. promotion of relationships with the banks
2. Cash equivalents do not include:
   a. short-term bills of exchange
   b. government bonds
   c. treasury market instruments
   d. deposits with the term of up to two years
3. Cash equivalents usually are such securities:
   a. with the nominal value of $ 1,000 or above
   b. with the redemption period of 3 months or less from the date of purchase
   c. with the redemption period of at least 6 months from the date of purchase
   d. with the redemption term which is the shortest of these two terms: operating cycle or one year
4. Acquisition of land through issuance of ordinary shares is:
   a. an operation which is not related with the use of cash assets and which is recognised either at the end of the cash flow statement or in notes to the financial statements;
   b. operation which is related with the use of cash assets and which is recognised in the cash flow statement;
   c. operation which is not related with the use of cash assets and which is recognised in the cash flow statement;
   d. operation which is recognised in the cash flow statement only when the direct method is used in its preparation.
5. In cash flow statements the types of the different activities are usually reflected in the following order:

a. operating, investing and financing activity;
b. operating, financing and investing activity;
c. financing, operating and investing activity;
d. financing, investing and operating activity.

6. Financing activity includes:
a. issuing of loans to other entities;
b. purchase of investments;
c. issuance of debt instruments;
d. purchase of long-term assets.

7. Investing activity includes:
a. repayment of any issued credit resources;
b. cash payments from creditors;
c. cash receipts from issuance of shares;
d. costs of assets borrowed.

8. The most important part of the cash flow statement is cash flows from:
a. operations;
b. investing activities;
c. financing activities;
d. basic operations which are not related with use of cash assets.

9. Interest received and dividends can be classified as cash flow from:
a. financing activities;
b. investing activities;
c. operating activities;
d. both operating and financing activities.

10. Which of the following operations does not affect the movement of cash?
a. writing off bad debts;
b. payment of customer debts;
c. sale of own shares repurchased from the shareholders;
d. exercising of rights for premature redemption of debentures.

11. Which of the following activities is unnecessary in preparing the cash flow statement?
a. assessment of changes in cash assets;
b. assessment of net cash flow from operating activities;
c. assessment of net cash flow from investing and financing activities;
d. assessment of the amount of cash on bank account.

12. Increase in accounts receivable during the reporting period means that:
a. revenues calculated according to the principle of matching revenues with costs are lower than the revenues calculated by using the cash principle;
b. revenues calculated according to the principle of matching revenues with costs are higher than the revenues calculated by using the cash principle;
c. revenues calculated according to the principle of matching revenues with costs are equal to the revenues calculated by using the cash principle;
d. costs calculated according to the principle of matching revenues with costs are higher than the costs calculated by using the cash principle;

13. Which of the following activities influences the amount of cash for the period reported?
a. Recognition of any depreciation costs of fixed assets.
b. Announcement of dividend disbursements.
c. Writing off debts the recovery of which is unrealistic.
d. Repayment of accounts payable.
14. The method of accounting pursuant to which net profit is adjusted by taking into account any operations that do not affect the movement of cash is called:
a. direct method;
b. indirect method;
c. working capital method;
d. method of matching revenues with expenses.
15. When using the indirect method, any increases in prepaid expenses for the period reported:
a. are deducted from net profit;
b. are added to net profit;
c. are neither deducted nor added, because it does not affect the amount of profit;
d. are neither deducted nor added, because it does not affect the amount of costs.
16. When using the indirect method, any expenses for writing off patents for the period reported:
a. are deducted from net profit;
b. result in the increase of the amount of cash;
c. result in the decrease of the amount of cash;
d. are added to net profit.
17. What should be deducted from net profit, when using the indirect method?
a. fixed asset depreciation expenses;
b. increase in accounts receivable;
c. increase in accounts payable;
d. decrease in prepaid expenses.
18. Which of the items listed below do not participate in the adjustment of profits when using the indirect method?
a. Expenses for depreciation of fixed assets.
b. Increase in prepaid expenses for insurance.
c. Increase in the value of a unit of land property.
d. Depreciation expense.
19. When the indirect method is used for the expense of patent write-offs:
a. it is added to the net profit from operating activities;
b. it is deducted from the net profit from operating activities;
c. it is recognised as a cash receipt in the section for investing activities;
d. it is recognised as a cash expense in the section for investing activities.
20. On disposal or equipment for cash the amount received is recognised as:
a. cash receipts from operating activities;
b. cash receipts from financing activities;
c. cash receipts from investing activities;
d. cash expense related with operating activities.
21. Which of the transactions below does not belong to financial activities?

a. Buyout of own shares.
b. Dividend payout.
c. Issuance of discounted bonds.
d. Purchase of long-term debentures.

22. Which of the items below is not recognised in the cash flow statement when using the direct method?
a. Cash payments to suppliers.
b. Cash receipts from customers.
c. Expenses for depreciation of fixed assets.
d. Cash receipts from disposal of equipment.

23. Which of the items mentioned below are not recognised in the operating activity section when the direct method is used?
a. Cash payments from customers.
b. Corporate income tax paid.
c. Profit on disposal of equipment.
d. Cash paid to employees.

24. Below the individual transactions of Elway Company are listed:
1. Ordinary shares were sold at a price above their par value.
2. Debentures have been issued in exchange for cash.
3. Interest has been received on short-term bills of exchange for which the redemption term is due.
4. Goods have been sold for cash.
5. Purchases of the stock of goods and materials have been made in cash.
6. Equipment has been bought for which it has been paid by a 10% bill of exchange with the redemption period of up to three years.
7. Dividends on ordinary shares have been announced and paid out.
8. 100 shares of Company 'XYZ' have been purchased in cash.
9. Land has been sold in cash according to the book value.
10. Debentures have been converted into ordinary shares.

You are required to state, to which of the following types of activities each of the above mentioned transactions belong.
a) operating transaction;
b) investment transaction;
c) financial transaction or
d) investment and financial transaction without the involvement of cash.

9. Practical Training Session and Exercises

Exercise 1

The costs of one production unit of an enterprise were as follows for the preceding five months:

Month	Costs (lats)	Volume of activity (hours)
1	97,000	6,000
2	100,000	7,600
3	98,000	6,200
4	110,000	7,900
5	115,000	8,000

By using the 'high-low' method assess the expected amount of costs incurred by the unit in sixth month if the expected level of production will be 6,500 hours?

Solution:

115,000 8,000
- 97,000 - 6,000

_____ _____
18,000 : 2,000 = 9.00 – variable costs per hour.

Total costs	115,000	97,000
Variable costs	9*8,000= 72,000	9*6,000=54,000
Fixed costs	43,000	43,000

Expected costs for 6,500 hours:
Fixed costs 43,000
Variable costs 6,500*9= 58,500
Total costs **101,500**

Exercise 2

Define the amount of critical costs involved in the production of Product A, if:
Product A required 200 kg of materials to produce which are also used in the production of Product B. 1 kg of this material costs Ls 8.00.

The amount of materials is limited; if it is used for the production of Product A, the amount of production of Product B will be reduced.

4 kg of the same material is used for the production of Product B, contribution per one unit of Product B is Ls 20.00.

Solution:

200*8=1,600.00 – variable costs involved if purchasing
20:4=5 – contribution per 1 kg of material
200*5=1,000.00 – opportunity costs incurred if Product B is not produced.

1,600+1,000= **2,600.00** – amount of critical costs involved in the production of Product A.

Exercise 3

An enterprise produces two types of products – A and B.

Data per unit:	A	B
Direct material costs (Ls per kg)	6	7
Direct labour costs (Ls 4 per hour)	12	16

Demand for Product A is 2,000 units, for Product B – 4,000 units.

What are the limiting factors of the enterprise if the volume of direct labour hours available is 23,000 hours and the amount of materials available is Ls 35,000.

Solution:

Items	Materials (kg)	Direct labour hours (hrs)
For 2,000 units of A	6*2000=12,000	12*2000=24,000
For 4,000 units of B	7*4000=28,000	16*4000=64,000
Total:	40,000	88,000
Available	35,000	23,000
Surplus/deficit:	- 5,000	-65,000
Limiting factor: both materials and direct labour hours	*	*

Exercise 4

Establish the optional flexible budgets for the enterprise (for 3,500, 4,000 and 5,000 units of output, respectively), if the following information is available:

- the highest recorded level of activity – 4,905 units and Ls 20,100 of costs;
- the lowest recorded level of activity – 3,800 units and Ls 19,050 of costs;
- the selling price per unit is Ls 5.20;
- use the marginal costing method in preparation of the budgets.

Describe the optional budgets

Solution

4,905-3,800=1,105; 20,100-19,050=1,050

1,050:1,105= 0.95 Ls per one unit of output

Total costs: 20,100 19,050

Variable costs: 0.95*4,905=4,659.75=4,660 0.95*3,800=3,610.00

Fixed costs: 15,440 15,440

Item	**Budget Option 3500**	**Budget Option 4000**	**Budget Option 5000**
Sales revenue	18,200	20,800	26,000
Variable costs of goods sold	0.95*3500=3329	4000*0.95=3800	5000*0.95=4750
Contribution	14,871	17,000	21,250
Fixed costs	15,440	15,440	15,440
Profit	-569	1,560	5,810

Exercise 5 THE FIRM 'ALPHABET'

The firm 'Alphabet' manufactures three products: (A, B and C) where the consumption of materials per unit according to pre-defined rates of usage are as follows:

Direct materials	*Price per*	*Usage of materials (in units)*		
materials	*units*	*for Product A*	*Product B*	*Product C*
V	0.55	5	4	-
W	0.50	3	2	6
X	0.35	-	3	5
Y	0.60	-	1	4
Z	0.80	1	1	-

There are no losses of materials for V, W, X, Y and Z in the production process. However, initial treatment is required for material Z in the process of which the amount of normal losses of 20% occur.

The four-weeks budgeted sales volume of production is as follows:

Product	*Number of units*
A	12,000
B	15,000
C	10,000

It is expected that 5% of Product B produced will not pass the quality check and will therefore be written to losses.

It is expected also that the period opening stock level will be as follows:

Finished products	*Number of units*
A	1,800
B	2,000
C	1,600

Materials:	
V	20,000
W	30,000
X	15,000
Y	5,000
Z	9,000

It is planned to increase the amount of stock of finished goods in order to diminish the time of completion of the orders. In order to increase the level of stock at the end of period by

10% more than at the beginning of period an increase in the output volume of the products must be planned. The stock of materials will be, on the contrary, reduced by 10% compared to the stock at the beginning of the period, as it has been admitted that the existing level of stock is excessively high.

Required:

Prepare the following functional budget plans:
(a) levels of output (in units)
(b) direct materials usage (in units);
(c) purchase of direct materials (in units and in Ls).

Solution

(a) Production plan:

	A	B	C
	No of units	*No of units*	*No of units*
Stock of finished products At beginning of period			
Production volume			
Losses			
Production sales volume			
Stock of finished products At end of period (Period opening stock x 1.1)			

(b) Direct materials usage plan (in units)

Materials	*V*	*W*	*X*	*Y*	*Z*
Product A (Materials usage per one unit x 12,180					
Product B (Materials usage per one unit x 16,000					
Product C (Materials usage per one unit x 10,160)					

Losses in the process of
treatment
Usage

(c) budget for purchasing of direct materials (in units and in Ls)

Materials	*V*	*W*	*X*	*Y*	*Z*
Period opening stock					
Period closing stock*					
Materials usage					
Purchase of materials					
The price of one unit					
Purchasing costs (Ls)					

Exercise 6 'VENTA', SIA

The business director of 'Venta', SIA is not satisfied with the reconciliation report between the budgeted and the actual results prepared by comparing the actual cost of sales with those provided in the fixed budget plan. He asks to prepare the flexible budget, i.e., optional budgets where the actual amount of sales for 19X7 would be taken into account. The following information has been made available for the development of the budget corresponding to the sales amount of 10 millions of lats.

	in thous. Ls
Fixed costs	
Salaries:	
to sales personnel	200
office employees	60
social insurance charges	32
rent payments	100
Depreciation of machinery	5
Depreciation of cars	67
Insurance costs	20
Advertising costs	250

	in thous. Ls
Variable costs	
Commission fees (to sales personnel)	64
Social insurance charges (12 ½ % of commission fee)	8

Miscellaneous expenses	25
Bad debts	100
Stationery and postal expenses	50
Payments for services to agencies	80

Jointly incurred costs
Telephone subscription fee: Ls 2,000, long-distance calls Ls 14,000
Car maintenance costs, except depreciation: fixed: Ls 7,000;
variable: Ls 48,000

When planning the expenses for research and development, information about the amount of costs and sales in the period from 19X2 to 19X5 and the expected results for 19X6 should be taken as the basis, the effect of inflation does not have to be considered. Presentation of the data by each year:

Year	*Costs thous. of Ls*	*Amount of sale revenue thous. of Ls*
19X2	384	4.2
19X3	402	5.1
19X4	368	3.4
19X5	450	7.5
19X6	Expected 478	Expected 8.9

Required:

(a) Prepare the optional budgets by using the marginal costing method for sales revenue amounts of Ls 10 million and Ls 11.5 million.

(b) Calculate the minimum amount of cost of sales allowed assuming the amount of sales revenue of Ls 10.75 million.

Solution

(a)

Optional budgets for year 19X7	*Amount of sales revenue Ls 10 million Ls*	*Amount of sales revenue Ls 11.5 million Ls*
Variable costs:		
Commission fees (to sales personnel)		

Social insurance tax
Miscellaneous expenses
Bad debts
Stationery and postal expenses
Payments for services to agencies
Long distance calls
Car maintenance expenses
Expansion and trade development
Costs (estimate)
Total variable costs
(= 5.89 % of the total amount of
sales revenue)

Fixed costs:
Salaries to sales personnel
Salaries to office employees
Social insurance tax
Rent payment
Depreciation of machinery
Depreciation of cars
Insurance expenses
Advertising expenses
Telephone subscription fee
Car maintenance expenses
Expansion and development of trading
Costs (estimate)

Estimate

Use the 'high – low' method in the estimation of fixed and variable elements of costs for expansion and trade development.

	Costs	*Amount of sales revenue*
	in thous. Ls	*in thous. Ls*
Lowest level in year 19X4		
Highest level in 19X6		

The variable costs for trade development and expansion for the sales revenue amount of Ls 5,500,000 is Ls 110,000. Therefore for a sales amount of Ls 1 million the costs constitute the amount of Ls 20,000.

The fixed costs respectively amount to Ls 368,000 – (3.4 x 20,000) = 300,000.

(b) Therefore the total amount of the cost of sales allowed assuming the sales revenue amount of Ls 10.75 million is as follows:

	thous.
Variable costs (Ls 10.75 million x 5.89 %)	
Fixed costs	
Total	

Exercise 7 'KOLORĪTS', A/S

The goods produced by of A/s 'Kolorīts', A/S (K, E and S) are mainly intended for export. When developing the budget for year 19X2 the firm discovers that the critical budgeting factor is the demand for the products and is therefore forecasting the following sales amounts at the following prices:

Type of product	K	E	S
Sales volume (units)	1,000	2,000	500
Selling price	Ls 50	Ls 75	Ls 100

The direct production costs per each type of product are as follows:

	K	E	S
Materials:			
Narrow leather band (Ls 0.1 a metre)	5m	6m	7m
Metal wire (Ls 2 per kilogram)	1.2 kg	1.3 kg	1.4kg
Labour force:			
Sewers (Ls 2 per hour)	1/2 hours	3/4 hours	1/1 hours
Assembly workers (Ls 3 per hour)	1/2 hours	1/2 hours	1/1 hours

The firm's stock of goods for sale constitutes 200 units of K, 200 units of E and 100 units of S. The stock of materials at the warehouse is 1,000 m of leather and 500 kg of wire. It is highly probable that the sales amount in year 19X3 will be equal to that of 19X2. Therefore, at the end of year 19X2 the expected amount of goods for sale should be planned in such an amount that they would cover 10% of the demand and the amount of stock of raw material – to cover for 20% of the demand.

Required:
Prepare the following functional budget plans:

(a) production sales budget;

(b) production budget of goods for sale (in physical units of products K, E and S);

(c) direct materials usage plan (for leather bands and wires in m or kg, as appropriate);

(d) the materials purchase plan (volume and amount in Ls);

(e) direct labour usage plan.

Solution 'KOLORĪTS', A/S

(a) PRODUCTION SALES BUDGET

	K	E	S	*Total*
Number of units				
Selling price per unit				
Sales revenue amount				

(b) PRODUCTION BUDGET (UNITS)

	K	E	S	*Total*
Amount of sales				
Period closing stock (1)				
Period opening stock				
Output volume				

(c) DIRECT MATERIALS USAGE PLAN

	K	E	S	*Total*
Leather band (metres)				
Wire (kilograms)				

(d) MATERIALS PURCHASE PLAN

	Leather band	*Wire*	*Total*

	m	*Ls*	*kg*	*Ls*	*Ls*
Materials usage					
Period closing stock (2)					
Period opening stock					
Purchase					

(e) DIRECT LABOUR USAGE PLAN

	Sewers *Hours*	*Assembly workers* *Hours*	*Total* *Hours*
K (900 units)			
E (2,000 units)			
S (450 units)			
Hourly rate			
Direct labour costs			

Exercise 8 'DUKĀTS', SIA

'Dukāts', SIA is considering the implementation of a capital investment project (purchase of machinery) with the following cash flow:

Year	Annual cash flow
0	-50,000
1	18,000
2	25,000
3	15,000
4	10,000

In addition to these data it is also known that the scrap value of machinery at the end of Year 4 will be Ls 2,000.
The cost of capital rate of 'Dukāts', SIA is 16 percent.

Your are required to:

a) calculate the net present value (NPV) of the revenues;
b) determine the internal rate of return (IRR) of the project.

'DUKĀTS', SIA

a)

Year	Cash flows, Ls	Discount factor 16%	Discounted value, Ls
0.			
1.			
2.			
3.			
4.			
Net present value			

$$\text{Discount factor} = \frac{1}{(1+r)^t}, \text{ where r - \% rate}$$

c) the internal rate of return of the project is higher than 16%. In order to define it, let us make the calculations with another (assumed) capital rate of return, for example, 18%.

Year	Cash flows, Ls	Discount factor 18%	Discounted value, Ls
0			
1			
2			
3			
4			
Net present value			

Exercise 9 CASH FLOW ANALYSIS

An enterprise requires a new production equipment item for ensuring of its operations, which will cost Ls 12,000 at the beginning of year 19X3. This item of equipment could be used for 5 years and then replaced by new equipment. The following cash flow applies for the useful life period (5 years) of the said equipment:

Net cash receipts/expenses (Ls)	6,600	6,000	4,500	-1,000	-2,600

Required:

a) If there is a loan taken for the purchase of the production equipment at the annual interest rate of 15% to be repaid over a period of 5 years in equal annual instalments, prepare the payment schedule for the repayment of loan principal and interest.

b) If there is a long-term loan is taken at the annual interest rate of 15% to be repaid only at the beginning of 19X8 and if for this purpose a bank deposit account is opened for accumulation of the necessary amount, prepare a deposit plan assumed that 5 equal periodic payments are made starting from the beginning of year 19X4 and that the bank pays an annual deposit interest rate of 10%.

c) Calculate the net present value of revenues generated by the production equipment over a period of 5 years if the discount rates are 10 and 15 percent respectively.

d) Determine the internal rate of return of the capital investment project as well as comment the results obtained under options a), b) and c). Compare the results and make the assessment of which is the most beneficial option. Do not take any tax payments into consideration.

Solution:

a) The annual amount of payment for redemption of the loan principal and the interest (x) can be estimated as follows:

Year	Cash flows, Ls	Discount factor of 15%	Discounted value, Ls
0			
1-5			

The payment schedule is as follows:

Year	Amount due to creditors at the beginning of year, Ls	Amount of interest accrued at during the year, Ls	Annual payment, Ls	Amount due to creditors at end of year, Ls
19X3				
19X4				
19X5				
19X6				
19X7				

The difference of Ls 1 is due to rounding. It can be seen from this payment schedule that over the 5 year period both the principal amount and the interest accrued can be repaid by the equal annual instalments.

b) As the loan is due only at the beginning of year 19X8, consequently, five years would have passed since the date of its issuance and the amount due by applying the compound interest rate would be as follows:

In order to accumulate cash required for the repayment of this loan at the beginning of year 19X8, there will be an account opened in the bank to be credited with 5 annual equal cash instalments. In order to estimate the annual instalment amount (x) the following periodic payment formula is used:

Annual payment (x) =
The deposit plan and the amount of increase in the total value of deposit will be as follows:

Year	Total deposit value at the beginning of period	Annual instal-ment	Inter-mediary amount	Interest (10%)	Total deposit value at end of period
	thous.	thous.	thous.	thous.	thous.
19X4					
19X5					
19X6					
19X7					
19X8					

It can be seen according to the plan how the amount required for repayment of the loan principal and interest of Ls 24,136 will accrue. (The difference of Ls 3 is due to rounding).

c)

Year		Cash flows, Ls	Discount factor 10%	Discounte d value, Ls	Discoun t factor 15%	Discounte d value, Ls
19X3	0					
19X4	1					
19X5	2					
19X6	3					
19X7	4					
19X8	5					

d) The internal rate of return on the invested capital can be estimated by using the formula applied under the interpolation method and the results obtained in the solution of Exercise (c):

Let us compare the two alternative options for repayment of the long-term loan:

i) if the loan is repaid in 5 years by 5 equal annual instalments, then the amount of each instalment is Ls 3,579.74;
ii) if the loan is repaid by one lump-sum instalment at the beginning of year 19X8 and if the cash required for this purpose is accumulated in the deposit account by 5 equal annual instalments, then the amount of each instalment is Ls 3,953.28.

It can be seen that option (a) is more beneficial as its annual instalment amount is lower. This can be explained by the fact that the interest income earned on the deposit (10% p.a.) are lower than the interest costs that would be paid on a loan (15% p.a.).

The internal rate of return of the capital investment project is ……. percent. This proves that it is not cost-effective to implement the project as the rate of the cost of capital is ..... percent.

Exercise 10 'PĒRLE', SIA

'Pērle', SIA is considering whether it is feasible to invest in the purchase of a new machinery in order to enhance the efficiency of its different technological processes.

Machinery costs Ls 70,000 and it is expected that its useful life would be 15 years. The estimates show that the machinery would have lost its value at the end of this period. An annual amount of Ls 14,000 could be saved on direct labour costs by operating this particular machinery. Maintenance of the machinery would cost Ls 3,000 per year.

If the new machinery is bought, the old one would be scrapped. It is predicted that by scrapping of the old, fully depreciated machinery, the amount of revenue gained on disposal would be Ls 5,000.

The cost of capital rate of 'Pērle', SIA is 10 percent. When making the estimates assume that any cash receipts, payments or savings are realised at the year end.

Your are required to:

a) For the purpose of assessing the expected capital investment project, estimate the following figures by applying several methods:

i) repayment period;
ii) accounting rate of return;
iii) net present value of income;
iv) internal rate of return.

b) How would the solution to Exercise (a) (iii) change if:

i) the book value of the old equipment would be Ls 4,000 according to the accounting data;
ii) the useful life of the new equipment would be only 10 years; or
iii) fixed overheads would be re-allocated and apportioned to this project by Ls 2,000 more; or
iv) the scrap value of the new equipment in 15 years would be Ls 3,000.

Solution

a) (i) *Repayment period for the capital invested*

Initial outlay of cash =
Cash savings per year (net) =

Capital investment repayment period =

(ii) Accounting rate of return

	Ls
Cash savings per year (net)	
Less: Annual depreciation of equipment (straight line method) 1/15 x Ls 70,000	
Added: Profit on disposal of old equipment = Scrap value – Book value per accounting data Ls 5,000 – Ls 0	
Total	

In Year 2 and in subsequent years:

	Ls
Cash savings per year (net)	
Less: Annual depreciation 1/15 x Ls 70,000	

Profit after depreciation	

Net present value

Year	Ls	Discount factor 10%	Discounted value, Ls
0			
1 - 15			

Internal rate of return on capital invested

In order for 'Pērle', SIA to accept the capital investment project its internal rate of return must be higher than the rate of the cost of capital (10%), for example – 15 percent.

Year	Ls	Discount factor 15%	Discounted value, Ls
0			
1 - 15			

1 1

It is not possible to evaluate whether this capital investment project is acceptable by applying the method of repayment period and the accounting rate of return method as there are no comparative data provided. However, by applying the net present value method as well as the internal rate of return method (iv) the results show that this project could be accepted on the condition that the cost of capital does not exceed 10% per year. The decisive criterion in this situation is the amount of net present value of the income produced.

b) Changing the conditions of Exercise

i) the solution does not change, but remains the same as under (a) (iii), because cash flow does not depend on the book value (non-depreciated) of fixed assets as per accounting data;
ii) the net present value of the income generated changes as follows:

Year	Ls	Discount factor 15%	Discounted value, Ls
0			
1 - 10			

Also in this case the capital investment project is cost-effective.

The solution does not change as these costs are insignificant for decision making.
The net present value of the income generated changes as follows:

Year	Ls	Discount factor 15%	Discounted value, Ls
0			
1 - 15			
15			

1 1

Given the above net present value the capital investment project is even more beneficial.

Exercise 11 CASH BUDGET

The following data have been obtained from the budget plan of a construction component manufacturing firm.

	Revenue from sales of production (with the VAT amount) in thous. Ls	Salary in thous. Ls	Purchase of materials in thous. Ls	Production overheads in thous. Ls	Admin. and selling overheads in thous. Ls
Year 19X2					
October	1.2	55	210	560	125
November	1.1	50	280	500	125
December	1	65	240	640	125
Year 19X3					
January	1.4	60	210	560	125
February	1.2	60	240	500	130
March	1.1	60	230	560	130

Other information is as follows:

The entire volume of goods is sold on credit with the payment term of 30 days upon delivery of goods to customers.

The actual payment, however, on the invoices issued to customers is collected as follows:

1) 60% of accounts receivable are paid by the end of the month when the goods have been purchased;
2) 30% are paid in the following month;
3) 5% are paid in the next month after the month following the delivery date disclosed in the invoice;
4) 5% constitute bad or doubtful debts.

Upon planning the collection of accounts receivable a 30 day month is assumed.

Salaries are paid in the month in which it accrues (to which it refers).
Suppliers are paid for the materials delivered in the next month following receipt of materials.
Production overheads are made up of 35% of the variable costs and different expenses that are paid for in the next month after they have been incurred. 65% of the total overhead costs are fixed costs, of which, Ls 164,000 are accounted for fixed asset depreciation. Payments for expenses constituting the fixed costs are made in the month of incurring.

CASH BUDGET

Note In order to ensure a correct understanding of Part (a) of this Exercise, a comprehensive and methodical approach, comprehensive outlining and clearly illustrated, detailed estimates are necessary.

a) (i) Budgeted cash flow

	Cash receipts	January in thous. Ls	February in thous. Ls	March in thous. Ls
1.	Sales revenue (1). (with the amount of VAT)	1.195	1.190	1090
	Cash expenses (payments)			
2.	Salary	60	60	60
3.	To suppliers for the materials	240	210	240
4.	Production overheads (2)	424	357	375
5.	Administration and selling overheads (3)	110	115	115
6.	Taxes	750	-	-
7.	Dividends	-	-	500
8.	Value added tax (4)	13	84	58
9.	Capital investments	1.000	-	700
10.		2.597	826	2.048
11.	Net cash receipts/expenses	-1.402	364	-958
12.	Opening cash balance for the month	1.450	48	412
13.	Closing cash balance for the month	48	412	-546

Transactions:

		January in thous. Ls	February in thous. Ls	March in thous. Ls
1.	Cash receipts from sales of			

	products (with the VAT)			
	Products sold in November:	55		
	5% in the second month following the delivery			
	Products sold in December:			
	30% in the next month following the delivery	300		
	5% in the second month following the delivery		50	
	Products sold in January:			
	60% of sales per month	840		
	30% in the next month following the delivery		420	
	5% in the second month following the delivery			70
	Products sold in February:			
	60% of sales per month		720	
	30% in the next month following the delivery			360
	Products sold in March:			
	60% of sales per month			660
		1.195	**1.190**	**1.090**

2. Miscellaneous cash expenses included in production overheads

	January in thous. Ls	February in thous. Ls	March in thous. Ls
Variable costs = (35% paid in the following month)	224	196	175
Fixed costs = (65% from total monthly expenses)	364	325	364
Less fixed asset depreciation	-164	-164	-164
	424	**357**	**375**

3. Administration and selling overheads

	January in thous. Ls	February in thous. Ls	March in thous. Ls
Per month	125	130	130
Less fixed asset depreciation	-15	-15	-15
	110	**115**	**115**

4. Value added tax

	January	February	March

	in thous. Ls	in thous. Ls	in thous. Ls
Accrued for goods delivered in the preceding month (18%)	153	214	183
Less input VAT amounts for goods and services purchased	-140	-130	-125
Tax payable	13	84	58

b) (1) There are several techniques for improvement of cash flows in the future:

- to improve the credit control procedures so that the payment for all sales of goods on credit is received within the term of 30 days and that the possibilities of bad and doubtful debt occurrence is reduced or eliminated;

- to sell as far as possible for immediate payment maybe even by applying a small trade discount to customers as an incentive;

- to enter into negotiations with the suppliers of materials on any possibilities for extension of their credit terms;

- to check if it would be possible to postpone the payment to the month after incurring for some expense items constituting the fixed costs. Similar analysis should be also undertaken in regard of administration and selling overheads.

- to carry out measures for the reduction of overheads and the improvement of efficiency in the utilisation of resources;

- to invest any surplus cash amounts in bank deposits in order to increase cash receipts by the interest earned; Accurate cash flow forecasts will help the management to take the right decisions regarding the periods for which the surplus cash amounts can be invested.

- 2) In order to reduce the amount of the bank loan requirement (Part (a) of Exercise) the following measures could be undertaken in the short term:

- to enter into negotiations with the suppliers of materials and other vendors on a short-term extension of their credit terms;

- to postpone the acquisition of the fixed asset item or enter into negotiations about the extension of the terms for making the instalments or reduction of the payment amount by increasing the number of instalments;

- to consider if it would not be possible to lease these fixed assets (possibly with the option of buyout) instead of purchasing them by preliminary instalments.

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