

MBAA812 Operational Management: Portfolio of Evidence

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An Executive Summary

The Centre for Governance (C-Gov) is a unit within the School of Government Studies, North-West University (NWU). It draws upon the expertise from the School of Social and Government Studies, Professional Development, as well as the Focus Area of Social Transformation (About Us, 2019). This Centre aims to apply this academic expertise from the North-West University as well as other supporting sources in order to present knowledge to the Government in a sustainable manner. This initiative allows the department to make a positive impact on the public sector, with a particular focus on the local government (About Us, 2019).

The process of Operational Management plays a significant role in the Centre of Governance. The operation procedures involve the preparation, organising, handling, monitoring as well as overseeing the processes of projects within C-Gov. Within this portfolio, the processes related to operational management within this department will be analysed. These areas are as follows: Global Environment and Strategy, Management of Projects, Forecasting and Demand, Product Design, Quality Management, Lean Processes, Job design, and Measurement, Planning and Scheduling (Heizer, Render and Munson, 2016).

The current trifold strategy of this department as well as what they do to promote themselves will be analysed. How C-Gov manages, its projects are investigated. Work tools like CPM and Work Breakdown Structures are introduced, and the benefits thereof will be discussed. Tools, which will improve and simplify the management of processes, will be presented. The current forecasting methods will be determined and suggestions on how to improve the accuracy will be made. Elements of quality will be discussed, and ways it can benefit C-Gov will be explained. The importance of risk management will be discussed and ways to manage it will be introduced.

Throughout this portfolio, the concept of standardization is emphasized. This will assist C-Gov to enable to determine their processes, predict the outcomes, as well as assist them in improving the quality. The importance of planning and methods of planning successfully are also discussed. This will allow the organization to manage its processes with confidence.

Operations Management focuses on the inputs and the outputs of organizations. The aim is to effectively manage these processes in order for an organization to perform successfully. By implementing the suggestions included in this portfolio, it will allow C-Gov to manage their operational management procedures more efficiently. It will also encourage C-Gov to base their processes on effective designs in order to optimize their service processes.

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1 Introduction

Several challenges to the organizational and developmental government currently exist within the structure of the South African socio-political and financial backgrounds. The government alone cannot solve this wide range and complex societal problems. This proposes an opportunity for higher education institutions, including the NWU, to assist the government with dedicated and subject-specific knowledge (About us, 2019).

The Centre for Governance (C-Gov) is a unit within the School of Government Studies (NWU). It draws upon the expertise from the School of Social and Government Studies, Professional Development, as well as the Focus Area of Social Transformation. This Centre aims to apply this academic expertise from the North-West University as well as other supporting sources in order to presented knowledge to the Government in a sustainable manner. This initiative allows the department to make a positive impact on the public sector, with a particular focus on the local government (About Us, 2019).

C-Gov presents to government-related short learning and formal programs. These programs are presented in an inventive and economical manner. In terms of the implementation of expertise, C-Gov aims for the following:

- Assist with consultation services within as well as, outside the University sphere.
- Investigating the relevance of these consultations to the subject field.
- Participation in research, which is commissioned by governmental departments, with the aim to develop suitable tools of research. The goal of this investigation is to address relevant demands and confirm the significance of these involvements.
- Commercialization of knowledge in the form of teaching and research.
- Encourage partnerships with relevant partners; both form the knowledge field as well as particular government entities.

Operations Management focuses on the inputs and the outputs of organizations. The aims to effectively manage these processes in order for an organization to perform successfully. This area of business management focusses on areas, for example, Lean operational management, Location strategies, Forecasting, Planning, and Scheduling etc.

2 Operational Management processes within C- Gov

Operational Management

The process of Operational Management plays a significant part in the Centre of Governance. The operation procedures involve the preparation, organizing, handling, monitoring as well as overseeing the processes of projects within C-Gov.

The aim is to ensure the timely delivery of courses as well as other related procedures within the department. Operations Management enables the coordinators of this department to run any project successfully. They aim to manage the day-to-day activities effortlessly. Focusing on optimizing of resources in order to maximize profit margins as well as focusing on the advancement of the general output of the department. C-Gov aims to provide “products” (both courses and commissioned projects) which support the client’s needs (Importance of..., 2019).

Global Environment and Strategy

The following initiatives are in support of the main strategies of the Centre for Governance: A strategy to support planned collaborations and systems within the relevant fields. A strategy to encourage multidisciplinary and trans-institutional collaborations between faculties, campuses, and research entities. Promoting and facilitating interaction and liaison with the public and private sectors in order to achieve cooperation and multidisciplinary interventions. C-Gov also facilitates appropriate coordinate engagement between the public sector and the NWU (About US, 2019).

C-Gov focusses on three key areas to promote their business (About Us, 2019):



Managing Projects

Classes within this department are offered via compulsory block contact sessions. Learners receive a course schedule explaining these periods. During these sessions, learners meet at lecturing venue in order to attend presentations offered by experts within the specific module.

The management and logistical arrangements of programs, including these sessions are handled as “mini-projects” within this department. These “projects” are divided among a group of project coordinators. The responsibility of the coordination of these projects, as well as their life cycle, becomes the responsibility of the project coordinator. Coordinators also manage set budgets and monitors expenditures related to the specific project. Other responsibilities also include management of learners, in terms of registrations and marks. And logistical arrangements, for example, venue booking, catering, travel arrangements for both the facilitator and the learners as well as the arrangements of study material, etc.

Projects should be managed in-line with specific time periods. The process starts with the compiling of a course schedule (as per provided template by the centre) and based on pre-set time guidelines (see Annexure A). The coordinator develops sub-checklists in order to complete tasks within the specific project period. The project cycle, as well as calculate deadlines should be able to adjustable, should the situation require it to do so. There is a critical path in the project timeline: the course schedule must be confirmed, following by confirmation of course arrangements. These actions have a ripple effect in terms of planning. For example, the course arrangements cannot be confirmed, if the arrangements (e.g. course dates) with the facilitator and the venue have not been established.

Forecasting and Demand

Forecasting is difficult to be determined within this department, because of various role players, plays an influential role. The government plays a vital role in the future of tertiary education. Issues for example: “Fees must fall” may influence the number of learners, and in return influence issues like the affordability of courses for learners. It may also have a vital influence on the income generated by university departments, and thus influences the sustainability of presenting courses. The National School of Government (NSG) also plays a vital role specifically within C-Gov. NSG indicates the training needs of government departments to C-Gov. They provide recommendations for the content of modules. Another department within the University, for example, the School of Government studies influences C-Gov in terms of academic support they may provide to them. They influence the content development of new study material will be.

This department currently bases its annual forecasting on the number of previous year enrolments. They adjust their budgets in line with previous expenditures, by taking inflation in consideration.

Product design

C-Gov offers educational programs as products, and therefore product design falls within the service delivery category. Modules are developed to meet the requirements provided by the National School of Government. These modules focus on educating individuals and providing them with solutions on how to deal with processes, as well as problem areas within the public sector. The scope of the program covers various key areas within the management of the public sector for example modules, which focusses on Finance and Human Resource Management.

C-Gov is currently bound by a three-year contract to offer skills development short courses in five provinces within South Africa. This contract is not automatically renewed and therefore, C-Gov needs to keep its competitive edge in order to be the preferred service provider of the NSG. They also offer two full-time programs, the BA in Public Governance, as well as the Post Graduate Diploma in Public Management. These are public courses and is open for any individual who wishes to study within this field. Both these full-time courses are also offered via contact sessions, enabling learners who are currently working, as well as from various areas to enrol for these programs.

Product variety and design are done on a continuous base. Modules in terms of overall curriculum design and themes are re-designed in a three-year cycle. The academic employees of the University also review modules content of current modules on a yearly basis. By reviewing and updating module content, the relevance of the content to current practices is ensured.

Quality Management

C-Gov provides quality in terms of the services provided by means of the following:

- making use of updated and relevant course material reviewed by academic staff;
- continuously reviewing cost-effectively and expenditures of projects, in line with the planned budget;
- providing study material to the learners, which is packaged in a user-friendly manner; and
- appointment of experts within the relevant fields, to act as facilitators during contact sessions.

Process design

The process design of the Centre for Governance (C-Gov) is based on the Service System design. Because learners enrol for the courses via NWU central administration, as well as via NSG, they do not have prior to contact with the department. The coordinators, who communicate after registration with the learners, therefore have a low need for a sales opportunity. Messages are communicated either via a mass communication medium (one-sided communication from the coordinator to the group, for example, messages via the eFundi student portal), or one-on-one communication between the coordinator and the learner (solving of individual queries or problems, for example via e-mail).

C-Gov makes use of computer-assisted communication mediums for example e-mails or communication via the online management system called eFundi. This makes communication both easy and cost-effective. Often learners do not live close to the university, and only attend contact sessions as per schedule. It is therefore seldom that learners come in personally to see the coordinators or even communicate via telephone calls.

The characteristic skills needed for process designs according to the Service-System matrix (Chase & Jacobs, 2019) are as follows:

Worker requirements	Clerical skills	Helpingskills	Verbal skills	Procedural skills
Focus of operations	Paper handling	Demand management	Script calls	Flow control
Technological innovations	Office automation	Routing methods	Computer databases	Electronic Aids

As coordinators mainly fill an administrative role within this department, it is evident that coordinators need to have clerical and basic customer service skills. However, due to the nature of the tasks presented in the coordination processes, it's also important that the coordinators need to be able to focus on technological innovations in terms of office automation. A lot of tasks is managed via online-based systems therefore, it is vital that coordinators understand and be able to adapt to the world of digital innovations. Due to the nature of the repetitive process of coordinators, this department has a high level of labour but have a low degree of customization within their process design.

Lean Processes

C-Gov provides guidelines in order to manage learner-related processes. This both affect the work processes of the coordinator, as well as the learner. Documents, for example, assignments completed by the learners can be managed within a process-related layout process. Material flows from one source to another. For example in this context, the “product” (assignment) would flow from the learner (who completed the assignment) to the coordinator (who manages the assignments as a bulk), to the module Coordinator (who marks the assignment). This process then repeats itself in reverse, when the results returned should be managed by the university and distributed back to the learner.

C-Go, for example, improved their layout design in terms of the process related layout mentioned above, in order to make the learning experience easier for a learner. Change, for example, are as follows:

- Learners can submit their assignment prior to finals submission, in order to receive a Turnitin Report. This allows learners to review their similarity index prior to their final submission, enabling the learner to re-work their assignment to avoid marks to be lost due to plagiarism or insufficient referring techniques.
- Learners are allowed to submit assignments after the initial deadline provided in the course schedule. However, penalty marks will be deducted for each date they submit after the due date. Learners will, therefore, have the opportunity to still receive a mark instead of 0% should

circumstances be that they are unable to submit on time. This assists a lot of working learners who miss deadlines due to unforeseen work-related instances.

- Learners are also now allowed to submit till 11:55 on the deadline date, instead of 15:00 in previous years. This also assists working learners with time constraints during working office hours.

Job design and work measurement

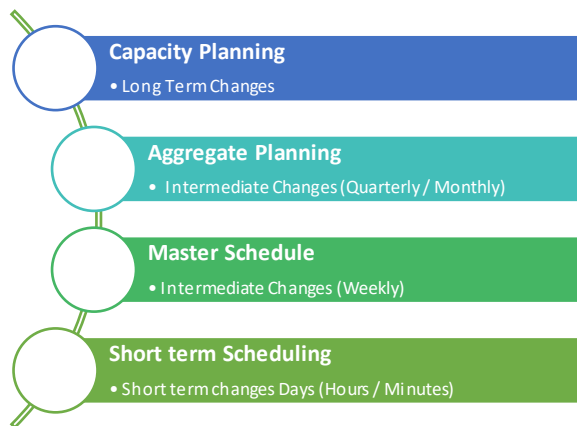
According to studies done by Hackman and Oldham, there are five required features of job design. They are skill variety, job identity, job significance, autonomy, and feedback. Based on these areas, the following can be said about job design within C-Gov (Heizer, Render and Munson, 2016).



Planning and Scheduling

C-Gov, as a service department, approaches planning and scheduling differently from those from a manufacturing department. Focus is placed on scheduling staff, coordination of learners as well as management of physical attributes for example venues and study material. They seldom maintain inventories. The labour intensiveness verifies during different periods of the scheduling-Gov currently does no planning in a universal structured manner. Coordinators do their own individual planning and adjust the processes based on their current situation. C-Gov can structure their planning based on four formal clusters, which are based on their different periods.

The periods are as follows (Heizer, Render, and Munson, 2016):



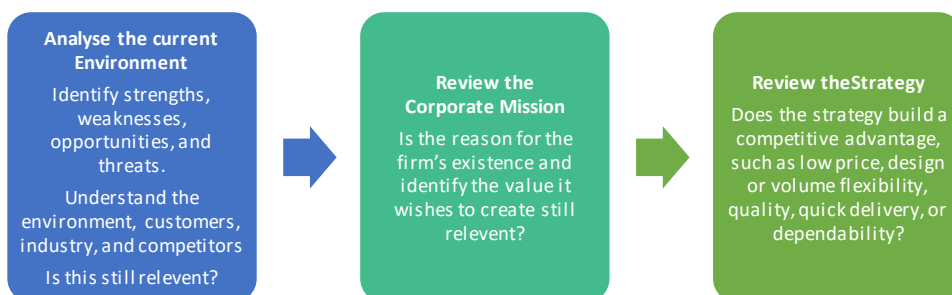
By planning training interventions ahead, coordinators can explore various options available, comparing options in terms of cost benefits as well as quality. It also enables them to manage a course schedule in terms of periods. For example, if textbooks for the class need to be imported from overseas, a longer period should be planned in order to receive the books on time. These time constraints are considered in terms of the work schedule. Specific demands are therefore prioritized. By managing a good schedule, the risk is identified and minimized which in return provides close to expected reliable outcomes.

3 Proposed Changes to Operational Management Processes of C-Gov

Global environment and Strategy

Strategy Development Process (Heizer, Render, and Munson, 2016):

C-Gov needs to review its strategy annually in order to determine if their aims are still relevant. The following 3 steps can be used in order to assist this process.



Business Operation Decisions:

Based on the outcome of the above-mentioned process, C-Gov can adjust their business operational decisions. Areas which they need to consider are as follows: They need to determine if their processes are still relevant in order for them to achieve their strategy.

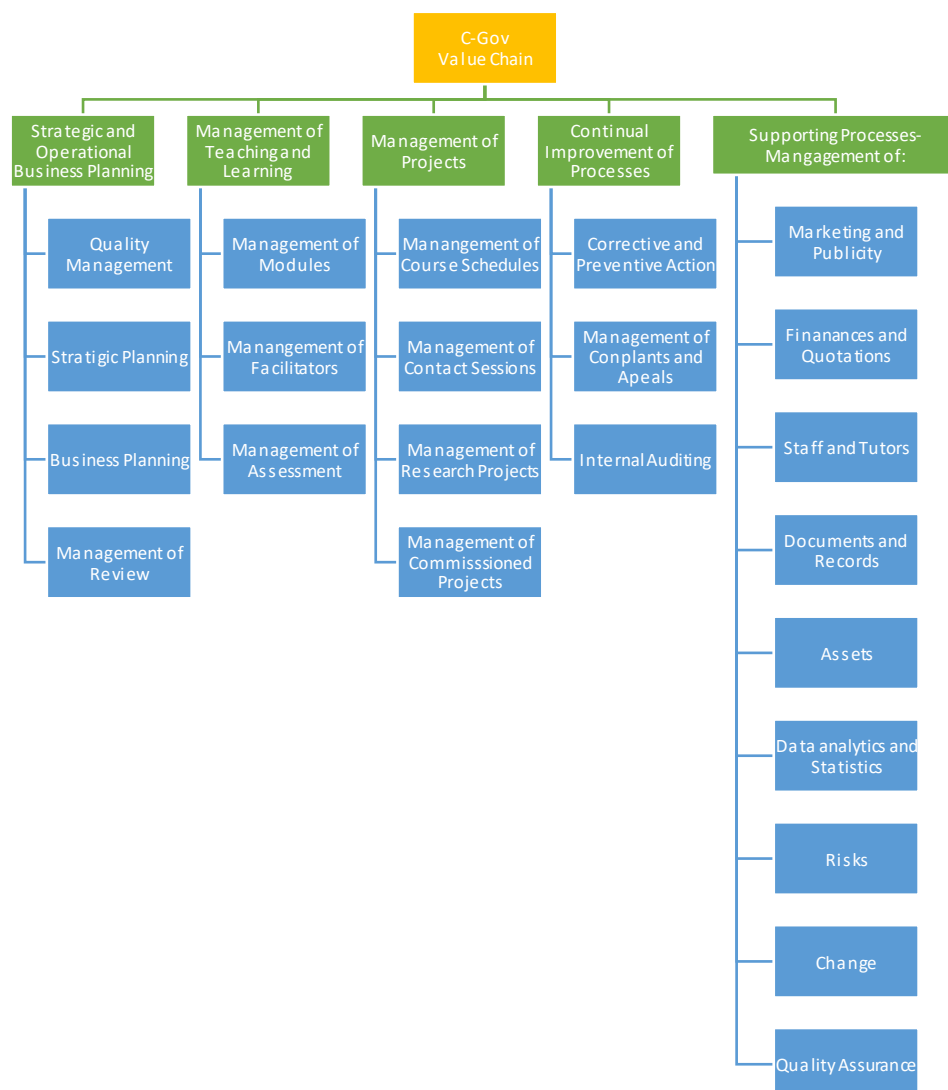
The can need to review current risks and act in order to minimize them, they can also then review the cost implications of possible changes. C-Gov needs to understand their market and how their market changes. They can then improve their products according to the requirements of their clients. This will in return appeal and retain business.

Managing Projects

The Framework of PERT and CPM:

C-Gov can design a PERT and CPM in order for their employees to understand how the processes within this department intersect with each other. They can then determine the work breakdown structure for each process. Employees need to understand the relationship of each activity, as well as the flow of each them.

The process can be an approach in terms of a network structure. The network will assist to understand the critical path of each procedure. It will also allow the coordinator to plan, design a timetable, monitor, and regulate each specific project. It is also easier to forecast the outcome of the procedure, knowing where in the timeframe of the process one is. The proposed value chain of C-Gov's procedures are as would be as follows:



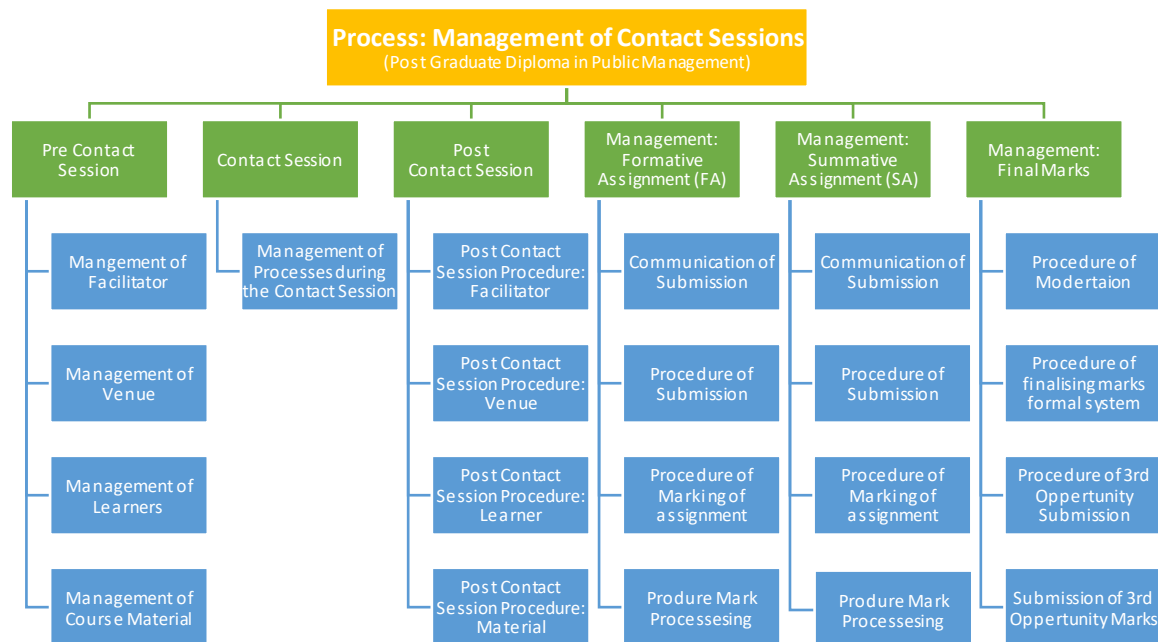
Work Breakdown Structure:

In order to plan projects in advance, C- Gov need to develop a plan. A Work Breakdown Structure can assist the C-Gov in order to break down a project in manageable components. Firstly the objectives of the process need to be established. These objectives can then be broken down further into smaller sub-objectives. This will assist the coordinator to view the “bigger picture”.

The typical structure of a WBS is typically designed according to levels. The levels are defined accordingly (Heizer, Render, and Munson, 2016):

1. Project
2. Major tasks in the project
3. Subtasks in major tasks
4. Activities (or “work packages”) to be completed

Processes can be plotted according to this hierarchical structure. For example the process: Management of Contact sessions which is as follows:



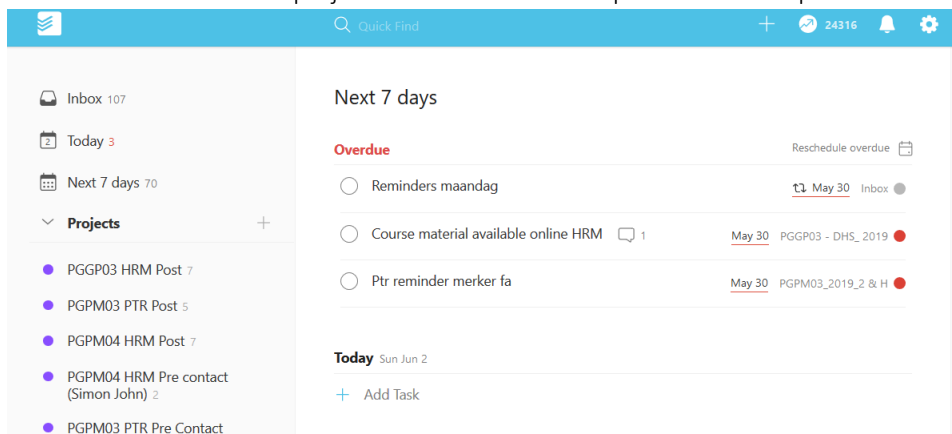
The coordinator than can use the “smaller projects” to allocate task and design standardized checklists in order to achieve the outcome of these processes. One can also allocate, deadlines, role players and material needed to execute the processes. This becomes part of the planning phase. The standardized checklist should be allocated to each of the processes on level three. Standard processes and checklists will provide consistency among coordinators as well as the outcome of the programs.

Computer-aided Programs:

Computer added programs might assist coordinators to determine deadlines and to manage projects more effectively. Computer added programs may increase productivity and end assist coordinators to manage their time more effectively. Reports can be generated instantly not manually as currently. Two suggested programs are, Todoist and MS Teams:

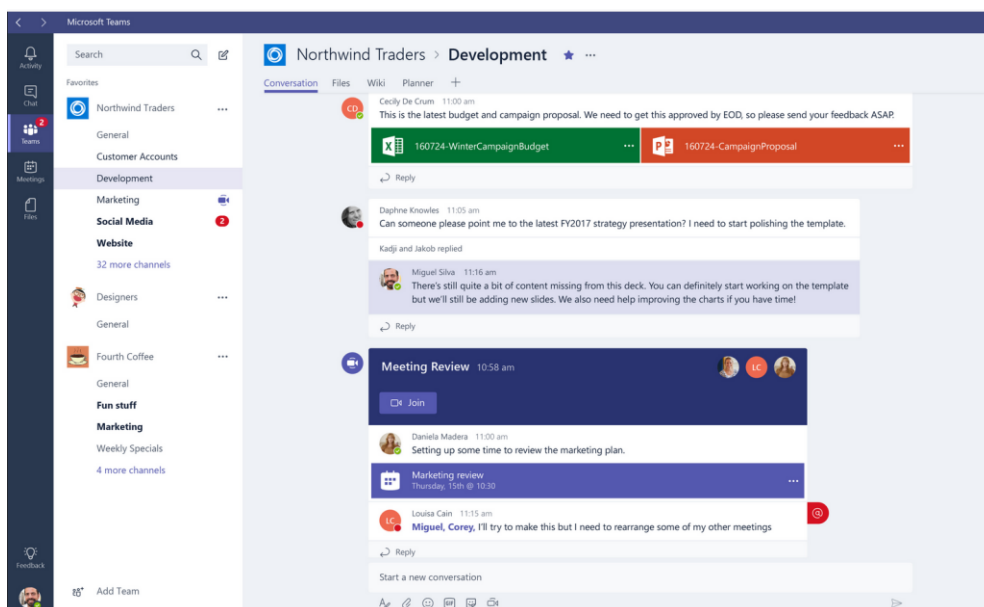
ToDoist

This software assists in the areas of product management, productivity, and task management. It will allow coordinates to keep track of tasks, which need to be done daily, as well as assist them to collaborate with certain projects. Below is an example of the work platform



Ms. Teams

According to Microsoft: "Microsoft Teams is a unified communications platform that combines persistent workplace chat, video meetings, file storage, and application integration. The service integrates with the company's Office 365 subscription office productivity suite and features extensions that can integrate with non-Microsoft products". Programs like this will assist C-Gov to manage processes more effectively, especially for a management perspective.



Monitoring and Evaluation:

The manager should make use of charts which enables him/her to monitor all projects within their project cycles at a given time, and so determine if it's on time or not. The impact of crashing should be monitored. Reports of failed processes should be documented and analysed order to avoid it in the future, as well as important changes to be made with procedures, need to be documented. Currently, this is not dealt with in a formal process. Templates, for example, the CAR, as well as Management of Change request form, can assist managers to manage and understand these problems. It will also assist the Manager to manage risks associated with these processes. An example of this template can be seen as an attachment.

Change Request Form:

This form enables a department to manage a request for change within a department. The document is divided in the following sections:

- The document needs to receive a unique number and be entered on a change register (database) for future reference.
- *Section A:* Within this section, the change is defined the current state is defined.
- *Section B:* This section describes the motivation for change.
- *Section C:* Within this section, the nature of the desired change is defined.
- *Section D:* A basic risk assessment is conducted in this section. Potential hazards for the change are listed, a rating of the hazard on a scale of low, medium and high are allocated. And lastly remedies to mitigate potential hazards are indicated.
- *Section E:* Within this section documents within the processes are identified, as well as the document owner. The document owner must sign off this section once the desired change has been implemented.
- *Section F:* Within this section, a list of the individuals who need to be consulted prior to the change need to be identified. As well as the list of the individuals who need to be informed about the change.
- *Section G:* The change need to be formally approved by the manager of the department. A review of the successful implementation of this change needs to be conducted.
- The person who initiated the change need to complete this document in order to initiate the process.
- After the change have been implemented the Quality Officer or Manager of the department must control if the change has been implemented and then a sign of this document.
- This change needs to be documented in the minutes of formal departmental meeting.

NCR-CAR FORM

This form enables a department to manage a descriptives from standard procedures within a department. The document is divided in the following sections:

- The incident need to be formally registered on a "Corrective Action Request (CAR) Register".
- A document needs to be filled in listing a unique number, a short description as well as the month and the year in which this incident happened. The nature of the business category, as well as type, needs to be indicated.
- *Section 1:* The source of the incident need to be indicated. (Selected from the list provided).
- *Section 2:* The details of the incident need to be indicated (Selected from the list provided). There is also a table in which details of the incident are provided. As well as who initiated the inside, as well as the date of the incident.

- *Section 3:* Within this section actions taken, with immediate effect to mitigate the incident need to be indicated. Areas of Who needs to do What by When are to be completed. The date of completion and by who also needs to be indicated once the action has been completed.
- *Section 4:* This section included the corrective and preventive action to prevent occurrence or recurrence of the incident. This action needs to be implemented by a given date, as well as when it has been completed must be indicated.
- *Section 5:* The results of an effectiveness review are indicated.
- *Section 6:* This section indicates the CAR clearance, once the incident have been resolved.

Critical paths within processes should be established in order to plan ahead alternative options and the impact of them in advance, and not only as crisis-controlled actions. This will also enable the manager to determine what influence it may have had on planned cost, quality and time.

Forecasting and Demand

Forecasting should be done in various scenarios, and not only annually based on the number of learners. By focusing on more areas, C-Gov will be able to plan ahead and adjusting to circumstances. Forecasting can be done more regularly in order to have a better and accurate understanding; it should also be done qualitatively and quantitatively. By doing some market research, this department can determine what the perception may be of stakeholders what the future may be of this department and base their forecasting on this predicaments.

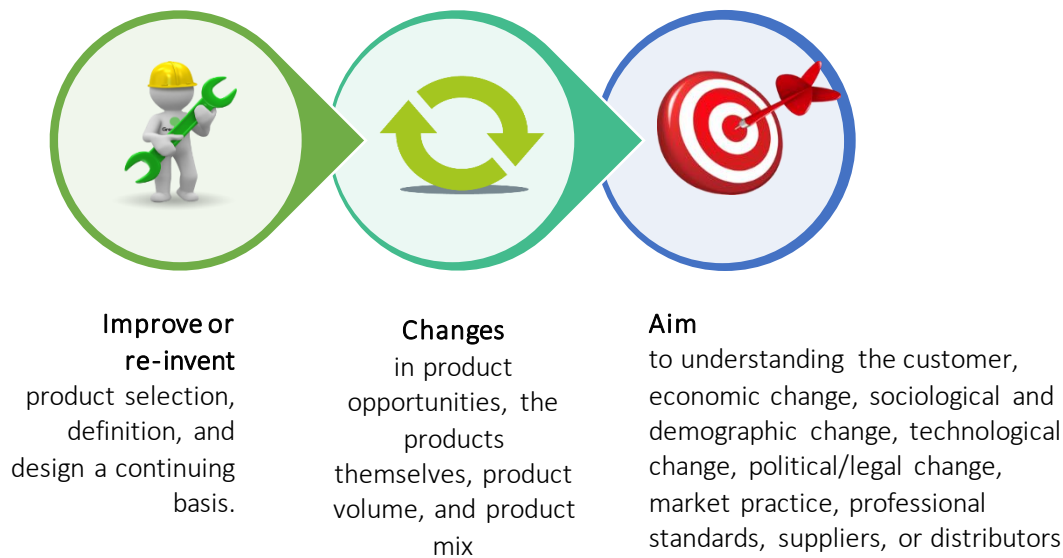
Steps were taken in Forecasting (Heizer, Render, and Munson, 2016):

C-Gov can make use of the following steps in order to make their forecasting more effective:

1. **Determine the use of the forecast:** For example: How many learners will be attending the courses. What are the trends of the current knowledge model?
1. **Select the items to be forecasted:** For example the different programs, all within their own criteria. Determine which areas of these programs need to be monitored
2. **Determine the time periods for the forecast:** Is it short, medium, or long term? Does it need to be developed daily, weekly, monthly annual? Shorter forecasting will be more effective?
3. **Select the forecasting model(s):** Will C-Gov be using a variety of statistical models?
4. **Gather the data needed to make the forecast:** Who and what data needs to be supplied, and from what time period?

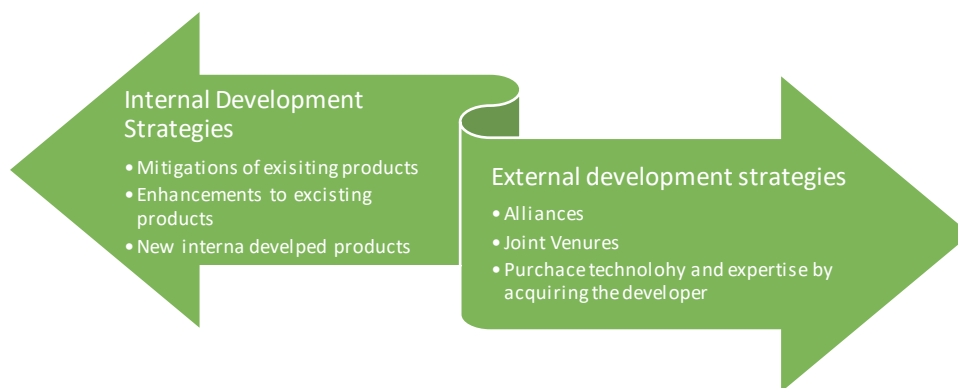
Product and Service design

Product design processes assist organizations to develop and implement a product strategy that meets the demands of the marketplace with a competitive advantage. The product design process allows organizations to (Heizer, Render, and Munson, 2016):



Product Development Continuum (Heizer, Render, and Munson, 2016):

C-Gov needs to approach their product (current course) and service design (how they present these courses) by looking at two areas, namely internally and externally. This will allow them to have a holistic view, and determine possible product changes:



Feedback from Clients:

Although questionnaires are distributed to receive feedback regarding sessions (see addendum A & B). This information is viewed as a report on the particular session, this feedback is not formally analysed in terms of using it to improve courses and services in the department. By formally analysing this feedback, further research can be done in order to improve their service delivery. Learners must be consulted to determine what they would like to have done differently within the course to make the course easier for them. These proposed changes can then be considered and implemented within the service delivery cycle.

External market research should also be done to what other content learners would like to receive within their courses. Often needs form management and employees differ. This feedback can be communicated back to the School of Governance as a recommendation.

Quality Management

Quality management is a continuous process, which focusses on improvement.

Plan-Do-Check-Act:

Walter Shewhart, developed a circular model known as PDCA (plan, do check, act). The following diagram shows the areas of this module (Heizer, Render, and Munson, 2016):



Quality management is very important to organizations, as this allows organizations to address the needs of the customer. The International Organization for Standardization (ISO 9001:2008) is a standard, which offers organizations quality management system guidelines, in order to achieve good management practices.

According to the brochure: “ISO 19001: How to used it” (provided by ISO), a QMS system will offer you the following to C-Gov:

- Assist C-Gov to define objectives, and in return allow organizations to recognize new business opportunities.
- Allow C-Gov to focus on customers. When their needs are met, it increases business.
- Allow C-Gov to define processes in order to work more productively and effectively.
- Allow C-Gov to meet statutory and regulatory demands.
- Allow C-Gov to expand markets.
- Assist C-Gov to identify risks and react towards them.

This standard identified key areas which C-Gov can focus on in order to achieve quality within the department (International Organization for Standardization, 2013).

They are as follows:

<u>Customer Focus</u>	•Meeting and exceeding customer needs •Retain customer confidence •Adapting to the future needs of an organisation
<u>Leadership</u>	•Good decision making by management •Defining a Mission for the organisation •Make sure everybody understand what and how they must do tasks
<u>Engagement with People</u>	•On all levels of the organisation and business
<u>Process application</u>	•How processes link together •Achieve more consistent and achievable results •Ensure efficiency within processes
<u>Improvement</u>	•Focus on improvement •Adapt to internal and external influences •Add value on all levels
<u>Evidence-based decision making</u>	•Decisions based on data, which lessens the degree of uncertainty •Analysis and evaluation of data, which lead to likely results
<u>Relationship Management</u>	•Involves suppliers •Plan to manage suppliers •Drive to success with the cooperation of suppliers

Preventive Action

Processes should be planned to take into consideration various role players working together. Processes owners should be appointed to uphold quality within that specific process. C-Gov can improve quality processes by reviewing these processes by means of:

- Meetings once-a-month
- Self-evaluations
- Audits
- Client satisfaction reviews
- Contractor evaluations
- Monitoring of processes
- Non-conformities should be managed

Measurement tools

By doing Risk Assessments, C-Gov could identify threats, and also assess and manage them. Corrective and preventive action can be put in place in order to manage non-conformities. Please refer to the template under attachments, which can be used as a way to understand the problem.

With this template, employees can identify risks. Provide immediate solutions, and also determine what went wrong in the process. Preventive measures can then be put in place in order to avoid repeating incidents.

Consistency in service delivery should be monitored formally. Measurement tools should be used to determine the quality of services offered by the C-Gov. C-Gov should develop, maintain and constantly improve a quality system, using the plan, do, check and act principles as guidelines. Processes should be designed to sustain customer (learner as well as the client, e.g. the National School of Government) in mind while exceeding expectations and needs. C-Gov should conduct a regular SWOT analysis to determine possible threats and opportunity to their quality process.

Training:

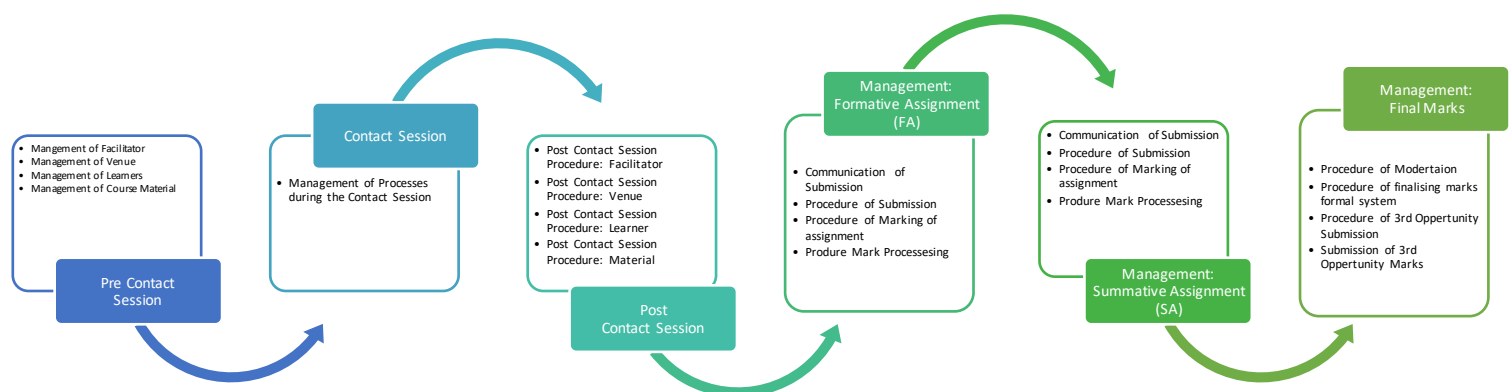
Training should be provided to the Coordinators of this department in order to allow all staff members to have the same skills level of quality delivery. This training will make them aware of ways in which quality can be approved.

Process design:

Standardized Processes and work charts:

Standardized process flow charts should be developed in order to ensure consistency. This will ensure consistency within the completeness and the delivery of tasks within the project cycle. All processes should be designed to sustain customer (learner as well as the client, e.g. The National School of Government) in mind while exceeding expectations and needs.

Example of C-Gov Contact Session Process Chart:

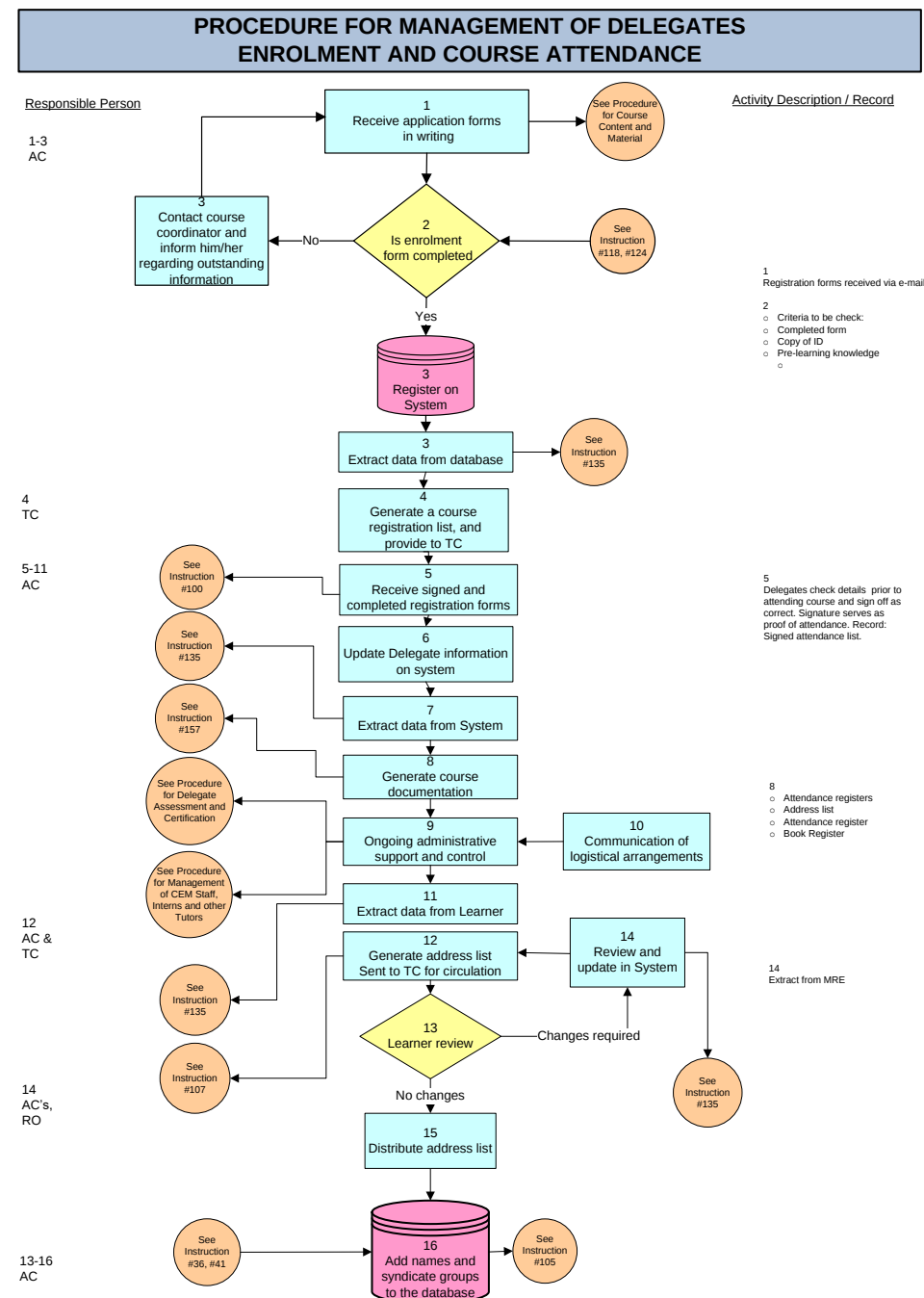


Computer Assisted Programs:

C-Gov should focus on skills development among the coordinators in terms of Electronic ads and Office Automatic. Coordinators sometimes still make use of primitive aids, which can be automated in order to work smarter and decrease the time used to complete a task in some areas of their processes.

Programs like “ToDoist and MS Teams” again, will allow work planning to be made easier. Because learners are managed in the same manner among programs, certain procedures and ways things are communicated could be automated as well as being standardized. Processes should be planned to take into consideration various role players working together. Processes owners should be appointed to uphold quality within that specific process.

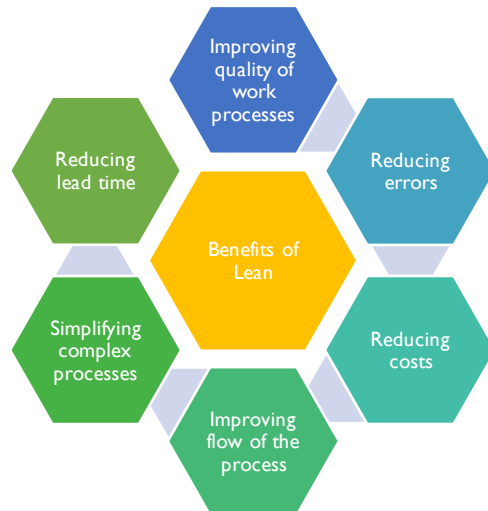
Example of Procedure “mind-map are as follows:



Lean Processes

Lean processes are the philosophy of continuous improvement. It aims to reduce wastes and improving a specific process.

The benefits of Lean Processes are as follows:



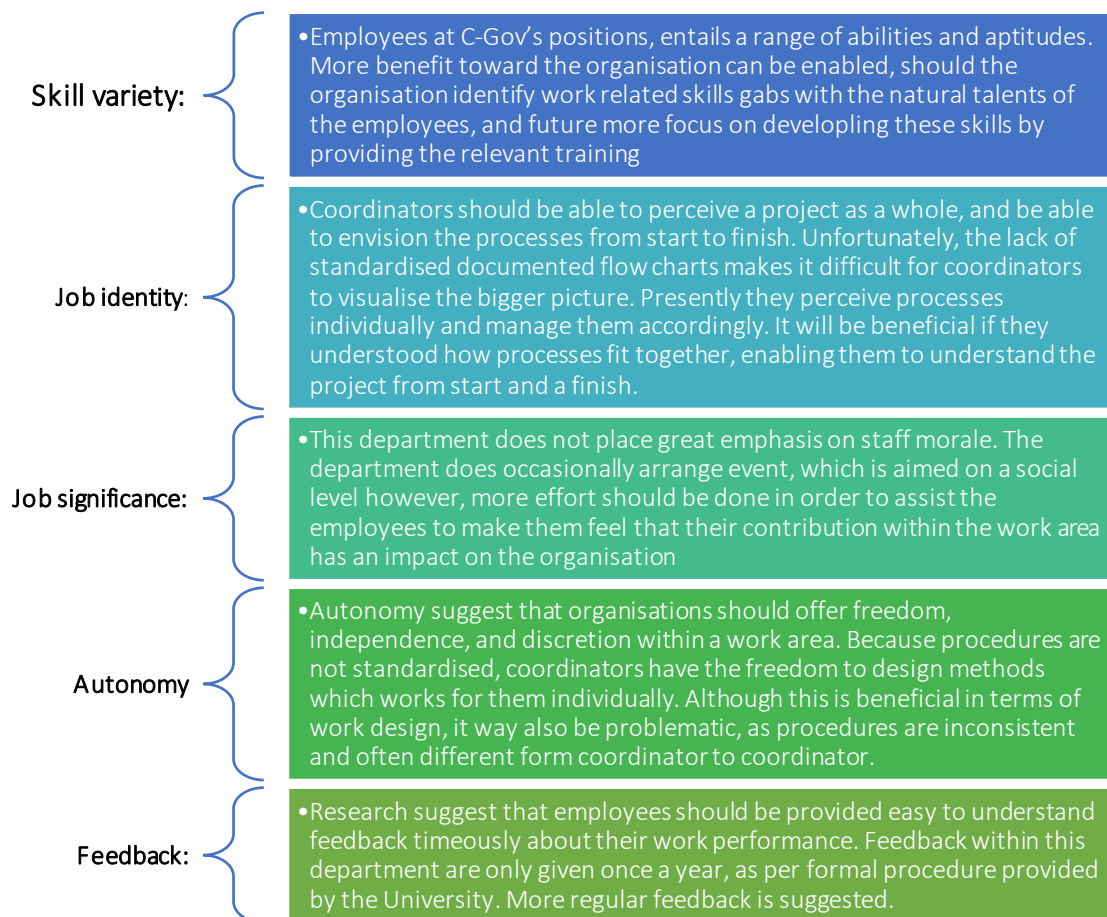
Improving Lean processes within C-Gov:

Although in terms of innovation, C-Gov is constantly trying to make the learning experience easier for a learner. It can still be refined further. For example:

1. Information should be available packaged in a user-friendly manner. The learner should understand the processes. Infographics can be used in order to explain the relevant process.
2. Frequent problems should be addressed by communicating preventive information to the learner at the beginning of a course. Information should be downloadable on a shared platform, without requesting it from a coordinator
3. Online communication platforms, for example, online application forms and queries should be made available to learners. Other processes, for example, application for extension on assignments should also be considered.
4. Learners could be provided with preloaded tablets containing all the information. This will save downloading time, as well as have an impact on the environment.
5. These tablets may contain an app, assisting learners with processes, for example downloading an academic record, or applying for credits. Automated messages reminding learners about deadlines can also be included, this will assist the workload of the coordinator, who is currently managing these process in a manual manner.
6. Communication is important to learners, especially in a multicultural level. Coordinators need or learn how to communicate to learners from different cultures, by respecting the specific culture, but also by remaining professional within a work context.

Job design and work measurement

C-Gov can implement the following changes within the areas of Job design and work measurement (Heizer, Render, and Munson, 2016):

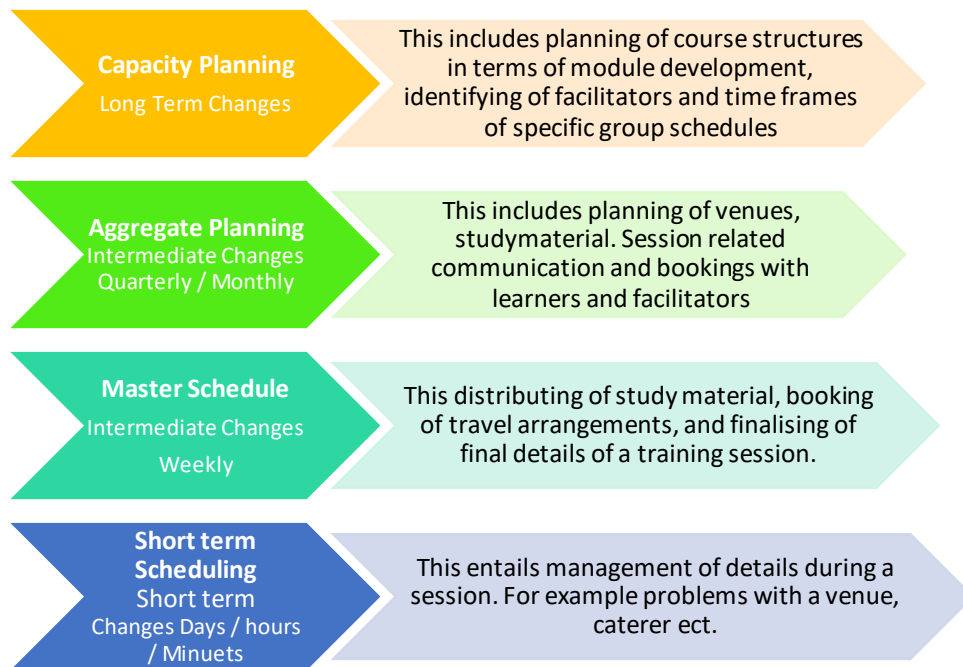


Planning and Scheduling

Scheduling in terms of "Work Cells"

C-Gov approach scheduling within "work cells". This allows a coordinator the make use of forward-looking scheduling, determine MRP due dates, as well as allow a coordinator to determine a detailed work schedule using work cell priority rules.

A typical work cell cluster is illustrated in this figure. *Within this figure the project schedule is broken down in four work cells, each related to their specific time frames* (Heizer, Render and Munson, 2016):



This time frame “work cells” works well for this department. The only suggestion is that I can suggest, is that these work cells must be aligned/incorporated with other procedures, for example, quality management, project and material management. This will allow better control over processes as well as the consistency of outcomes form all coordinators.

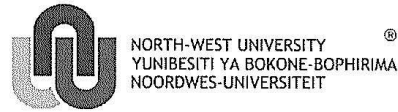
4 Conclusion

Within this Portfolio the Centre for Governance within the North-West University were introduced. The important areas of Operational Management were analyzed. These areas are as follows: Global Environment and Strategy, Management of Projects, Forecasting and Demand, Product Design, Quality Management, Lean Processes, Job design, and Measurement and Planning and Scheduling (Heizer, Render and Munson, 2016).

Within the context of Operational Management theory, the processes within the C-Gov not critically discussed. Areas improvement within the said areas were identified. Various methods of improving these processes, and reasons why it should be improved, as well as examples of how were introduced.

Operations Management focuses on the inputs and the outputs of organizations. The aims to effectively manage these processes in order for an organization to perform successfully. By implementing, the suggestions included in this portfolio, it determined within this study will allow C-Gov should to have operational management procedures, which is based on the effective design as well optimizing of the service process.

5 Permission to use C-Gov within this study:



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E-pos: jordaan.johan@nwu.ac.za

30 Januarie 2019

Aan wie dit mag aangaan

Geagte Meneer / Mevrouw,

Die draer van hierdie brief is 'n MBA-student in my Operasionele Bestuur klas. My onderrigbenadering is om eerder die teorie toe te pas op die organisasie waar hulle werksaam is (of in gevalle waar dit nie moontlik is, 'n organisasie van hul keuse) as net om gevallestudies te gebruik as praktiese toepassing.

Gedurende die semester sal van die student verwag word om 'n ondersoek in die organisasie te doen op elk van die onderwerpe wat in die module gedek word en om verbeterings rakende elk van hierdie onderwerpe voor te stel, gebaseer op die teorie. Die voordeel vir u as 'n organisasie, is dat die student krities sal kyk na geleenthede in die organisasie, en dat hy / sy as gevolg hiervan meer waardevol behoort te wees vir die organisasie. In die klas gebruik ek dan geselekteerde gevallestudies (waarvan ek slegs die naam van die maatskappy noem indien die student namens u spesifiek toestemming gee om die naam met die ander te deel) vir klasbespreking. Dit sal vir u met die bykomende voordeel gee van gratis buite-insette van 'n kundige paneel "konsultante".

Aan die einde van die semester sal van die student verwag word om 'n portefeulje in te dien wat bewys dat hy / sy die toepaslike teorie in die organisasie kan toepas. In hierdie portefeulje moet hy / sy onder andere 'n bewys van u voorlê dat hy / sy die leerpunte met u gedeel het. Indien u dit toelaat, sal hy / sy moet ook bewys lewer van die implementering van hierdie beginsels deur 'n foto joernaal voor te lê. Uit vorige ondervinding kan ek van studente se goeie oordeel in hierdie verband getuig. My afskrifte van hierdie portefeuljes sal na die semester vir 'n tydperk van drie jaar toegesluit word.

Van my kant onderneem ek om vertroulikheid te handhaaf deur die volgende:

- deur nie sensitiewe inligting met iemand te deel nie, indien u inligting as sensitief aandui;
- deur moderators met dieselfde vlak van etiese verbintenis te gebruik;
- om slegs na die maatskappy se skuilnaam te verwys, indien u so versoek; en
- om nooit sonder u toestemming enige feite oor u bedryf te publiseer nie.

Indien u anonimiteit verlang, dui asseblief hieronder so aan, hou die oorspronklike brief en stuur vir my 'n afskrif saam met die student, of e-pos dit vir my by die bogenoemde adres. Indien u enige vrae of navrae het kan u my gerus kontak.

Groete,

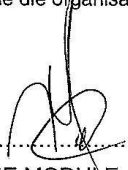
Johan Jordaan

Lektor, Operasionele Bestuur

NWU Skool vir Besigheid en Korporatiewe Bestuur

Student se naam: Theresa Ruen Studentenommer: 21631123

Ek sou verkies om nie die organisasie se naam in verslae te gebruik nie weens mededingende redes (J / N).

Geteken:  Posbenaming: Bestuurder: C-Gov

TEMAS IN HIERDIE MODULE GEDEK

1. Bedryf en produktiwiteit
2. Die globale omgewing en bedryfstrategie
3. Bestuur van projekte
4. Vraag-vooruitskatting
5. Produkontwerp
6. Kwaliteitsbestuur
7. Prosesontwerp
8. Plekbesluite
9. Uitlegbesluite
10. Taak-ontwerp en werkmetering
11. Voorsieningskettingbestuur
12. Bestuur van voorraad
13. Beplanning en skedulering
14. MRP en ERP stelsels
15. "Lean" bedryf
16. Instandhouding en betroubaarheid

Vriendelike groete

Johan Jordaan
Dosent: Operasionele Bestuur

6 Reflection of what you have learned

Within this module, I have learned the major areas of Operational Management, and learn to evaluate current scenarios in order to improve them. I have also learned to understand processes practically and how to use different tools to implement, manage or improve them. I know have a good understanding of all the concepts of Operational Management, and can Aim to manage these processes within my own work environment successfully.

This module has thought me that any organization needs to add value in order to exist. It needs to constantly improve its processes in order to add Quality in modern times. Operational Management is about handling and enhancing these transformations. The following personal attributes were improved during attending this module: Critical thinking, Problem-solving, Leadership. Self Management, Cultural awareness, Decision making, and Communication.

Mr. Johan Jordaan taught us that there is always an innovative and creative way to approach processes within Operational Management. He introduced us to complex managerial issues and ethical oversight, which we needed to complete the projects within this module. He made use of fun and interactive ways to understand complex issues. He thought me what you don't know, you can't manage. And that in order to grow, change is necessary. He also taught me that the more you plan, the less you need to schedule. But above all, he taught me that the most valuable aspect of the business is people and that you need to always invest in them first.

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7 Assignments

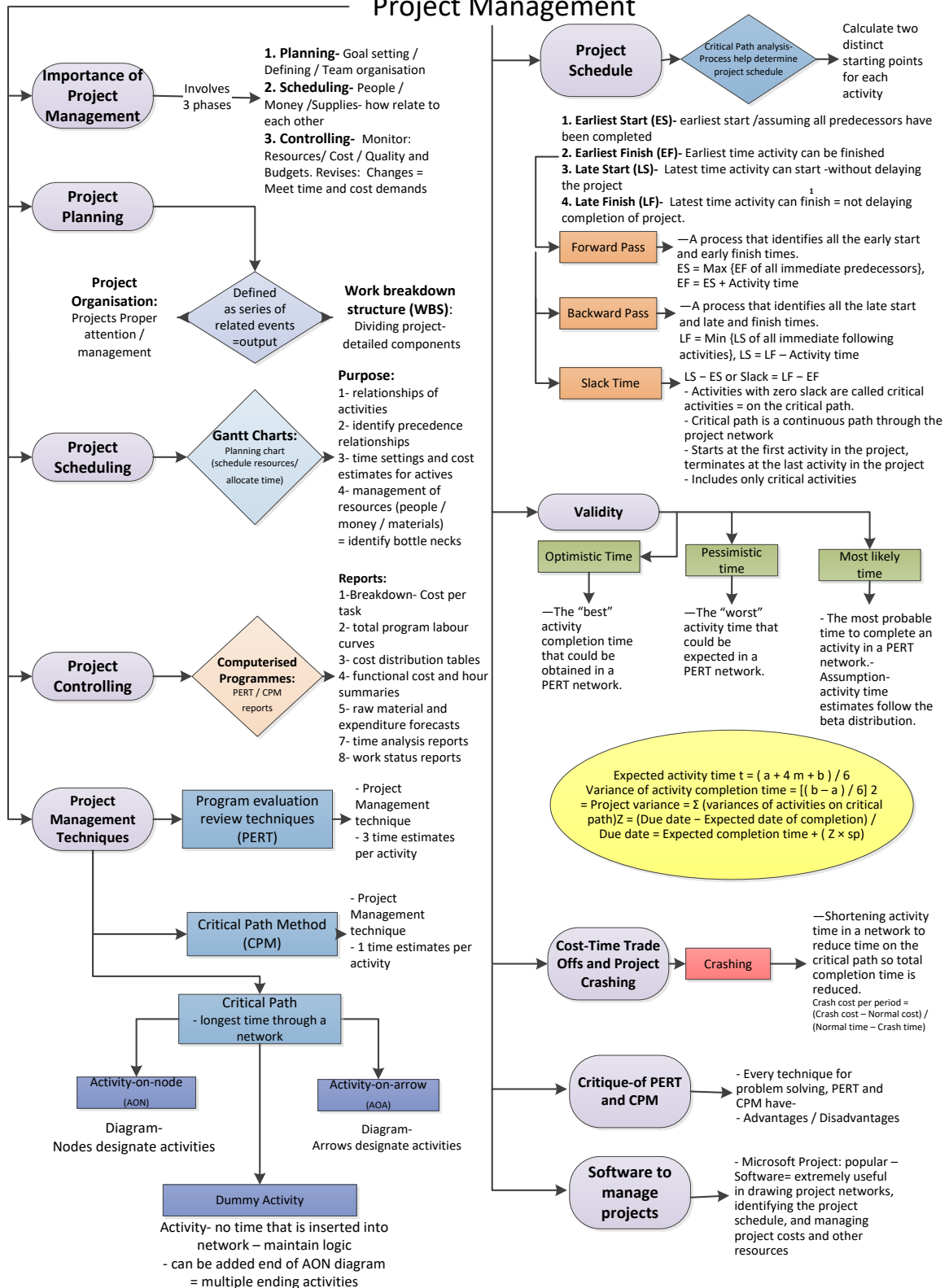
7.1 Contact Session 1

Individual submission: Contact session: 1 (Long)

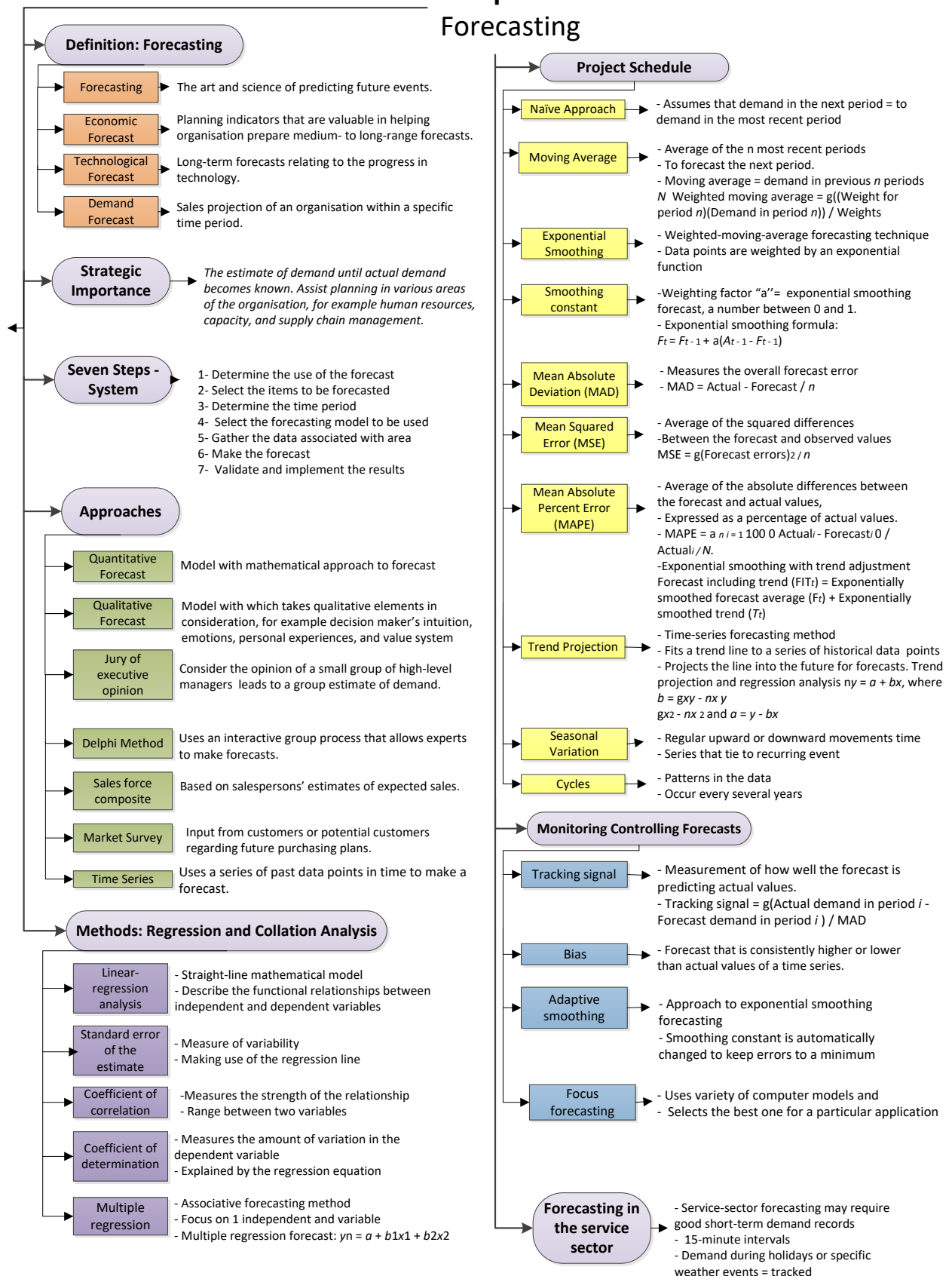
Topic(s): Project Management and Forecasting (Heizer, Rende, and Munson, 2016)

Chapter 3

Project Management



Chapter 4 Forecasting



Nature of business: C-Gov is a department in the NWU, which offers formal, as well as skills development courses to individuals who work in the Public Sector.

Contact session A: How this theory is applied in the organization at present

Project Management

- This department subdivided their formal courses, as well as their skills development courses among a group of project coordinators.
- It is the project coordinators responsibility to coordinate sub-projects within the course's life cycle.
- For example, Courses are offered via block contact sessions. During contact sessions, learners meet a lecturing venue in order to attend lectures offered by experts within the specific module.
- It is the coordinator's responsibility to arrange everything related to this contact session. This may include venue booking, catering, and travel arrangements for both the facilitator and the learners, arrangements of study material act.
- It is also the coordinators responsibly to keep within the set budget and monitor expenditures.
- The Coordinator starts its process by developing a course schedule. This is done on a provided template by the centre, and based on present time guidelines (see Annexure A)
- It is then the coordinator's responsibility to develop sub checklist to do all the actions within the specific project deadline.
- It is also the Coordinators responsibility to adjust the project cycle, and recalculate deadlines should the situation require it to do so.
- There is a critical path in the project timeline- For example; one can make no arrangements if the facilitator and the venue have not been established.

Forecasting

- Forecasting is difficult to determine within this department because of various role players an important role. The role players are as follows:
 - The government: Issues like fees must fall may influence the number of learners
 - The National School of Government: This department indicates the needs of government departments. They also indicate what the recommended content must be of modules
 - School of Government studies- This department indicates what the Academic support of the development of new study material will be.
- This department currently base their forecasting on previous enrolments
- They also adjust their budgets in line with previous expenditures, as well as taking cost increases and inflation in consideration
- Forecasting is only done annually

Contact session A: Proposals on the improvement of this element of the organization's operations:

Project Management

- Processes planning should be standardized. Documents used in projects and standard checklist should be used in order to provide consistency among coordinators.
- The manager should make use of charts which enables him/her to monitor all projects within their project cycles at a given time, and so determine if it's on time or not.
- Computer added programs might assist coordinators to determine deadlines and to manage projects more effectively.
- Computer added programs may increase productivity and end assist coordinators to manage their time more effectively. Reports can be generated instantly not manually as currently.
- The impact of crashing should be monitored. Reports should be provided of the impact in order to avoid it in the future. Currently, this is not dealt with as a formal process.
- Critical paths within processes should be established in order to plan ahead alternative options and the impact of them in advance, and not only as crisis controlled actions. This will also enable the manager to determine what influence it may have had on planned cost, quality and time.

Forecasting

- Forecasting should be done in various scenarios. Not only as what is happening at the moment
- This will enable the organization to plan ahead and adjusting to circumstances.
- Forecasting can be done more regularly in order to have a better and accurate understanding.
- Forecasting can be done qualitatively and quantitatively. By doing some market research, this department can determine what the perception may be of stakeholders what the future may be of this department.

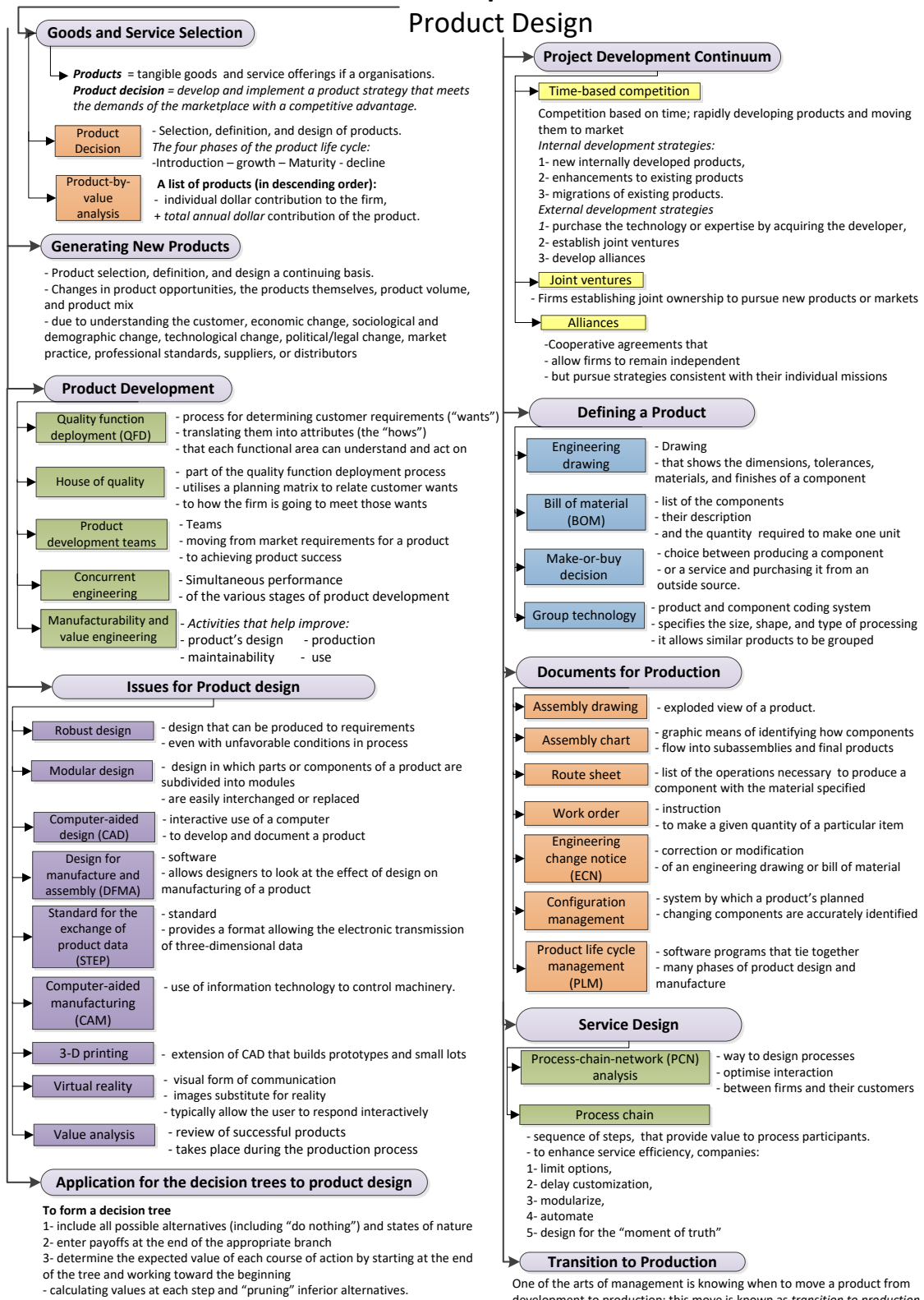
See- Annexure: Course schedule

7.2 Contact Session 2

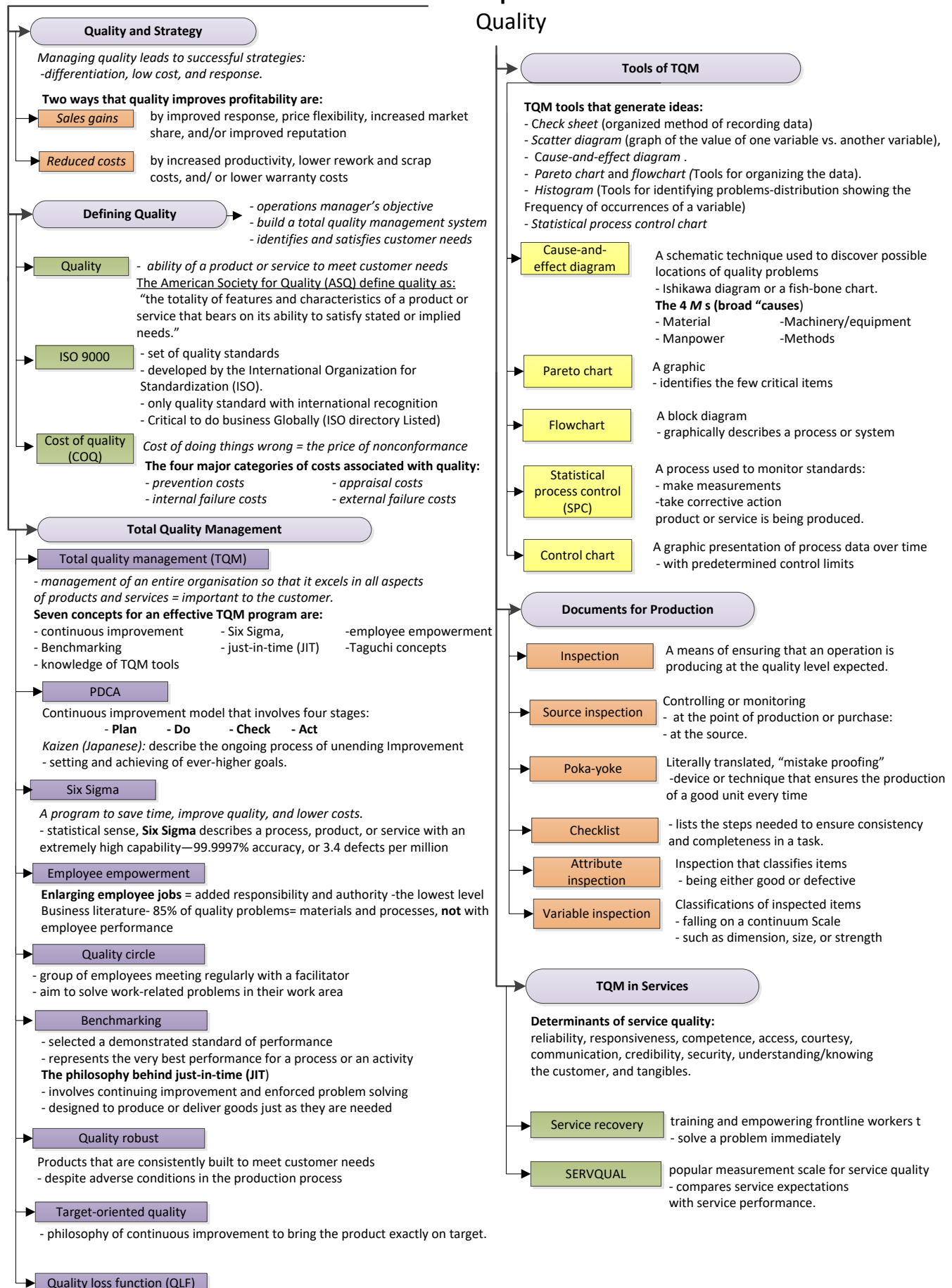
Individual submission: Contact session: 1-Short

Topic(s): Project Management and Forecasting (Heizer, Render, and Munson, 2016)

Chapter 5 Product Design



Chapter 6 Quality



Nature of business:

C-Gov is a department in the NWU, which offers formal, as well as skills development courses to individuals who work in the Public Sector.

Contact session A: How is this theory is applied in the organization at present

Developing goods and services

- C-Gov offers educational programs as a product. This product falls within the service delivery category.
- Modules are developed to meet the requirements provided by the National School of Government. These areas focus on problem areas within the public sector. For example Finance and HR.
- C-Gov currently bound by a three-year contract to offer the skills development courses in five provinces within South Africa. They also offer two full-time programs, the BA in Public Governance, as well as the Post Graduate Diploma in Public Management.
- This contract is not automatically renewed; therefore, C-Gov needs to keep its competitive edge in order to be the preferred service provider.
- Product selection and design are done on a continuous base. Modules are re-designed in three-year cycles. This ensures that the content is relevant to current practices. Modules are also reviewed on a yearly basis.
- Other academic staff review module content in order to determine if the content is relevant to the industry.

Managing Quality

- C-Gov provides quality towards their services by means of the following
 - They make use of updated course material reviewed by academic staff from the School of Government studies
 - They review cost-effectively during all their cost sessions
 - Study material is packaged in a user-friendly manner
 - C-Gov makes use of experts within the field to act as facilitators during contact sessions.
- Each course coordinators are currently making use of their own designed work charts. This may lead to inconsistency of service delivery, as these documents differ from each other.
- Discrepancies and events that are not standard to the norm are not formally monitored. Systems are there not in place to investigate why something happens and put preventive steps in place in order to avoid this incident to happen again in the future.
- Standardized checklists are not used, this leads to inconsistency within in the completeness and the delivery of tasks
- Measurement tools are not in place to determine the quality of services offered by the C-Gov.
- Coordinators of this department all have different skills level of quality delivery and are often unaware of ways in which quality can be approved.

Contact session A: Proposals on the improvement of this element of the organization's operations:

Product and Service design

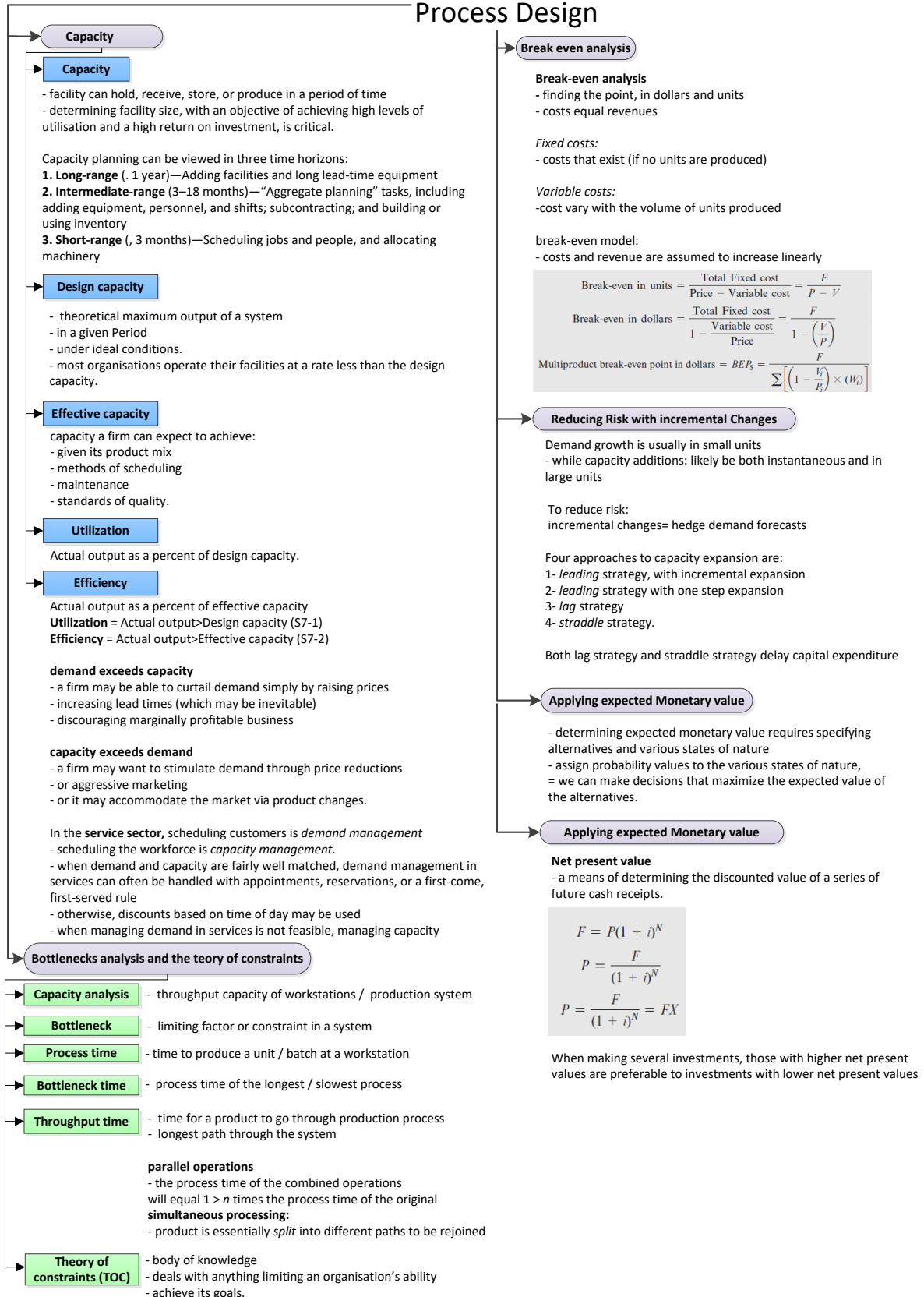
- Although questionnaires are distributed (see addendum A & B), to receive feedback regarding sessions, this department does not review the feedback formally. No further research is done in order to investigate statistics and therefore be able to improve their service delivery. Learners must be asked what they would like to have differences within the course to make the course easier for them. This feedback can be reviewed and then be considered. Changes can then be implemented within the service delivery cycle
- Market research should also be done to what areas learners would like to receive training in. Often needs from Management and employees differ. This feedback can be communicated back to the School of Governance as a recommendation.

Quality Management

- Standardized process flow charts should be developed in order to ensure consistency
- Consistency in service delivery should be monitored formally. Systems should be put in place, in order to investigate why something happens and put preventive steps in place in order to avoid this incident to happen again in the future.
- Standardized checklists should be used; this will ensure inconsistency within the completeness and the delivery of tasks within the project cycle.
- Measurement tools should be used to determine the quality of services offered by the C-Gov.
- Training should be provided to the Coordinators of this department in order to allow all staff members to have the same skills level of quality delivery. This training will make them aware of ways in which quality can be approved.
- C-Gov should develop, maintain and constantly improve a quality system, in line with the plan, do, check and act principles
- All processes should be designed to sustain customer (learner as well as the client, e.g. National School of Government) in mind while exceeding expectations and needs
- C-Gov should conduct a regular SWOT analysis to determine possible threats and opportunity to their quality process.
- Processes should be planned to take into consideration various role players working together. Processes owners should be appointed to uphold quality within that specific process
- Quality processes could be improved by reviewing processes by means of:
 - Monthly business meetings
 - Self-evaluations
 - Internal and External Audits
 - Customer satisfaction surveys
 - Supplier and management reviews
 - Monitoring and measurement of key processes in line with pre-set guidelines
 - Non-conformities should be managed
- Risk assessments should be conducted to identify threats, assess and management
- Corrective and preventive actions in relation to non-conformities can be placed as part of the quality plan.

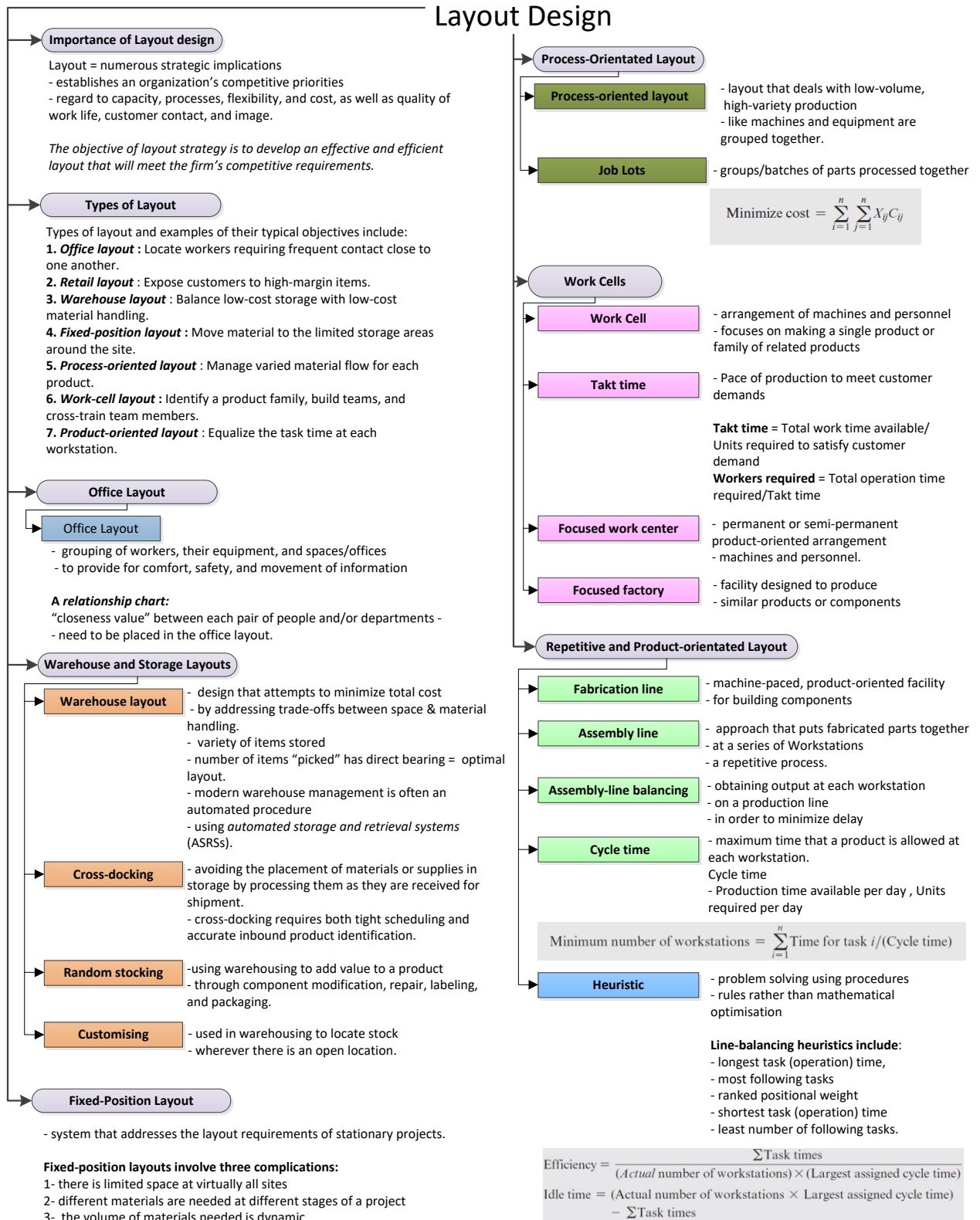
Chapter 7

Process Design



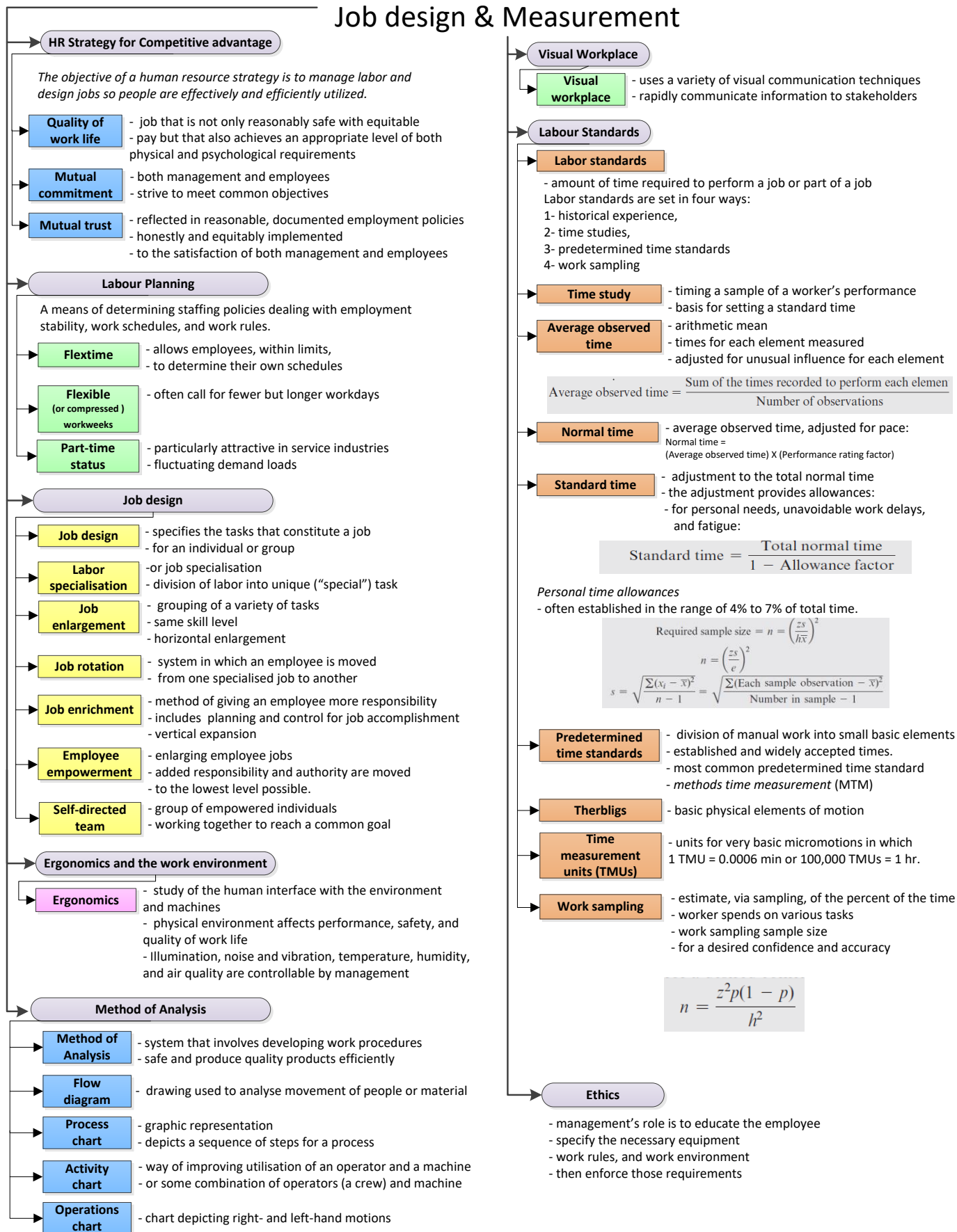
Chapter 9

Layout Design



Chapter 10

Job design & Measurement



Nature of business:

C-Gov is a department in the NWU, which offers formal, as well as skills development courses to individuals who work in the Public Sector.

Contact session: How is this theory is applied in the organization at present:**Process Strategy:**

The Centre for Governance (C-Gov) makes use of a Service System design. Because learners enrol for the course prior to contact with the coordinators, the coordinators have a low need for a sales opportunity. Communication via the coordinator and the learners are dealt with on either a mass communication (one-sided communication from the coordinator to the group) or one-on-one communication between the coordinator and the learner (solving of individual queries or problems).

Therefore, C-Gov makes use of computer-assisted communication mediums for example e-mails or communication via the online management system called eFundi. It is seldom that learners communicate via telephone or come in personally to see the coordinators (as the courses are offered via contact medium and often the learners lives far away).

In terms of the characteristic needed, according to the Service-System matrix (Chase & Jacobs) are as follows:

Worker requirements	Clerical skills	Helping skills	Verbal skills	Procedural skills
Focus of operations	Paper handling	Demand management	Scripting calls	Flow control
Technological innovations	Office automation	Routing methods	Computer databases	Electronic aids

Although coordinators need to have clerical and basic customer service skills, it's important that they are able also to focus on technological innovations in terms of office automation.

This department, therefore, has a high degree of labour but have a low degree of customization.

Lean Processes

In terms of innovation, C-Gov is constantly trying to make the learning experience easier for a learner.

Innovations implemented in 2019 are for example as follows:

- Learners can submit their assignment prior to finals submission to receive a Turnitin Report. This allows learners to review their similarity index prior to submission, enabling the learner to rework their assignment to avoid marks to be lost due to plagiarism or insufficient referring techniques
- Learners are allowed to submit assignments after the deadline, but a penalty mark will be deducted for each date they are late. Learners will, therefore, have the opportunity to still receive a mark instead of 0% should circumstances be that they are unable to submit on time.
- Learners are also now allowed to submit till 11:55 on the deadline date, instead of 15:00 as previously. This assists working learners with time constraints during working hours

Contact session: Proposals on the improvement of this element of the organization's operations:

Process Strategy:

C-Gov should focus on skills development among the coordinators in terms of Electronic ads and Office Automatic. Coordinators sometimes still make use of primitive aids, which can be automated in order to work smarter and decrease the time used to complete a task in some areas of their processes.

Programs like "To-Doist" and MS Teams can allow work planning to be made easier. Because learners are managed in the same manner among programs, certain procedures and ways things are communicated could be automated as well as being standardized.

Standardizations should be implemented without making the learner feel that they are just a number. Therefore personification should also be an aim.

Layout

Although in terms of innovation, C-Gov is constantly trying to make the learning experience easier for a learner. It can still be refined further. For example:

7. Information should be available packaged in a user-friendly manner
8. Frequent problems should be addressed by communicating preventive information to the learner at the beginning of a course. Information should be downloadable without requesting it from a coordinator
9. Online communication platforms, for example, online application forms and queries should be made available to learners.
10. Learners could be provided with preloaded tablets containing all the information. This will save downloading time, as well as have an impact on the environment.
11. The tablets may contain an app = assisting learners with processes, for example downloading an academic record, or applying for credits
12. Communication is important to learners, especially in a multicultural level. Coordinators need or learn how to communicate to learners from different cultures, by respecting the specific culture, but also by remaining professional within a work context.

What is there about the topic that I would like explained further in class?

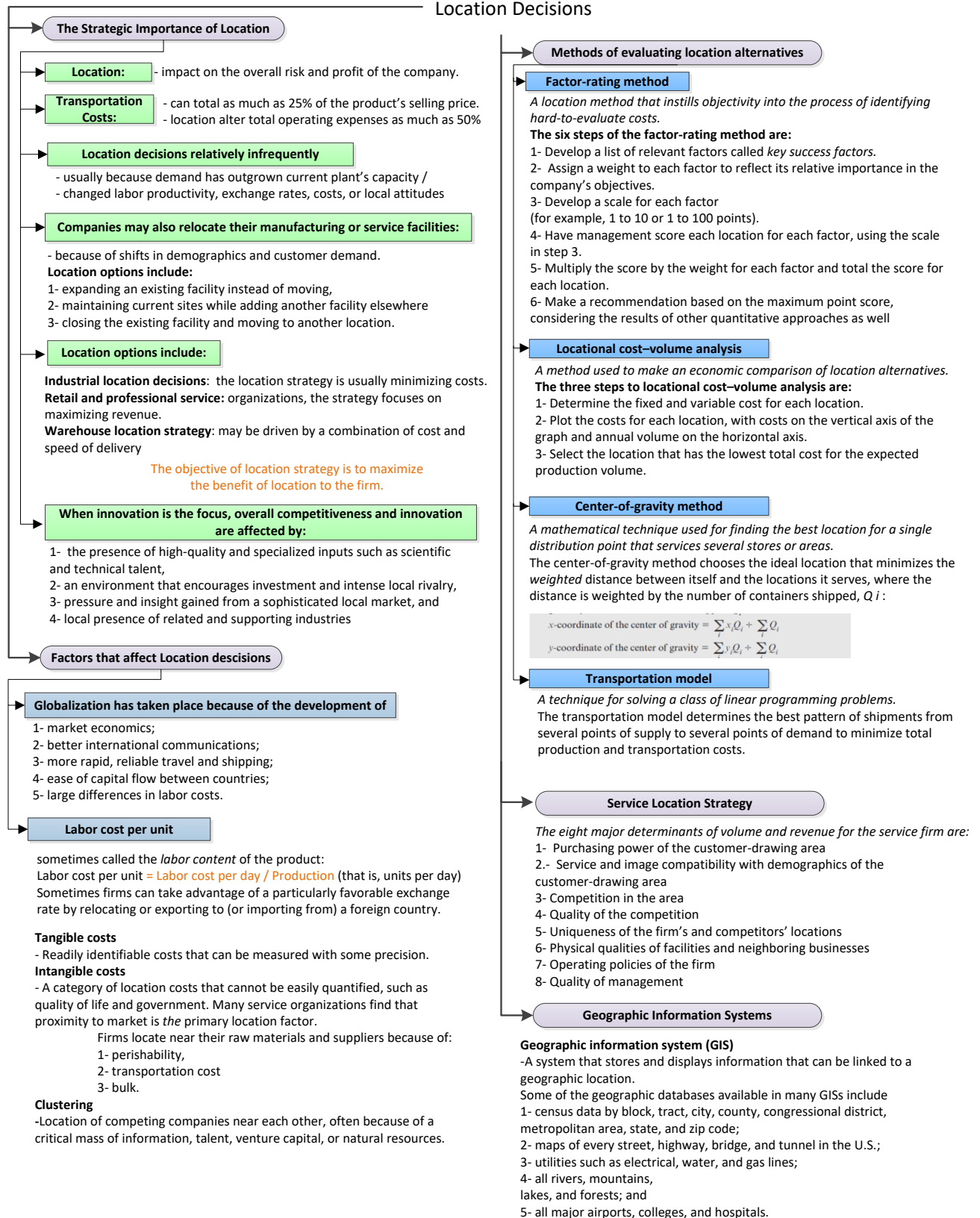
- Could you kindly explain the ROAM model in more detail?
- Kindly gives some tips on how to be a people person, while being an introvert.

7.3 Contact Session 4

Individual submission: Contact session: 4

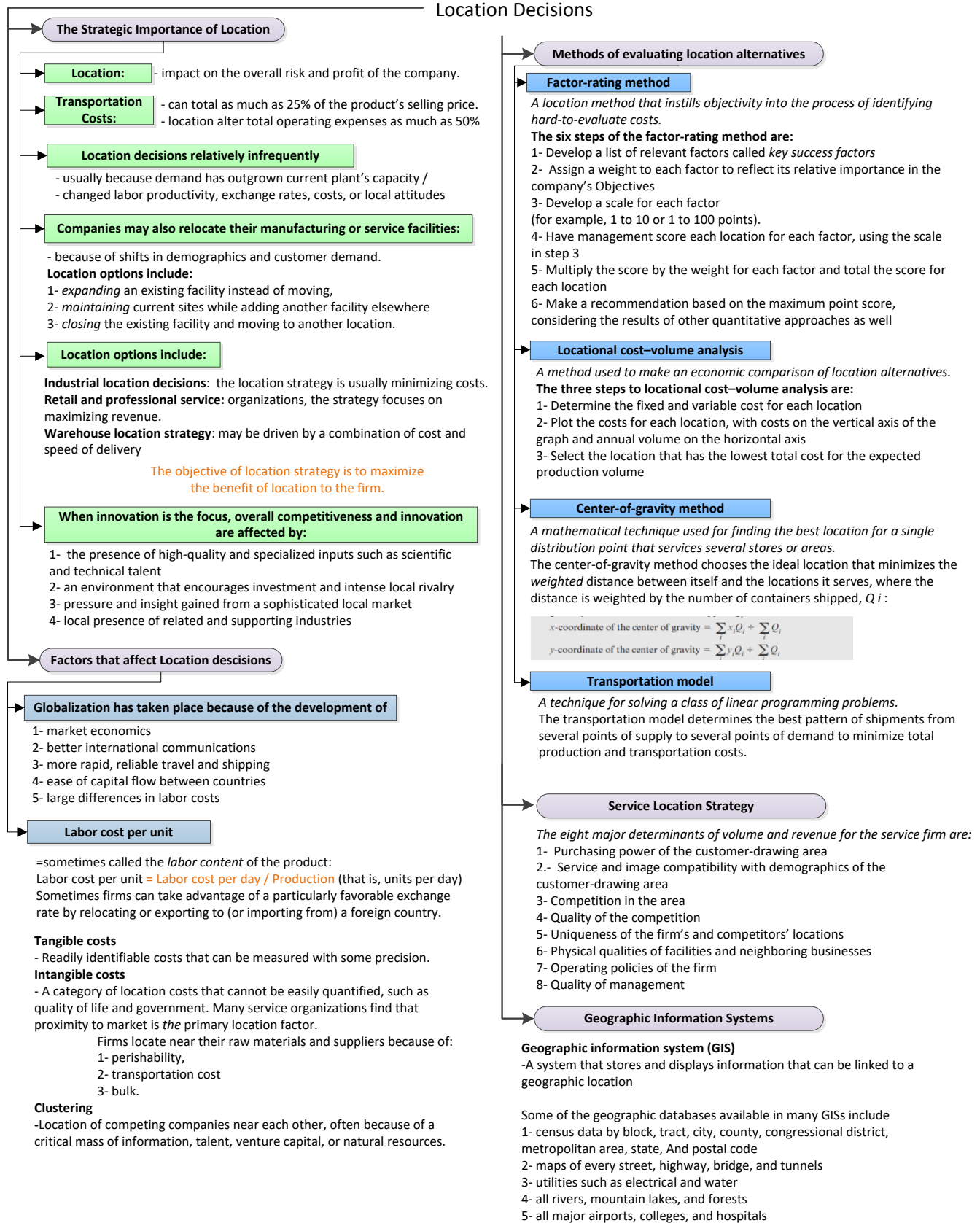
Topic(s): Location, Supply Chain and Inventory (Heizer, Render and Munson, 2016)

Chapter 8 Location Decisions



Chapter 8

Location Decisions



Chapter 11 Supply Chain Management

Techniques for evaluating Supply Chain

Many supply chain metrics exist that can be used to evaluate performance within a company and for its supply chain partners.

Evaluating Disaster Risk in Supply Chain

- Disasters that disrupt supply chains can take on many forms
 - firms often use multiple suppliers for important components
 - to mitigate the risks of total supply disruption
- The probability of all n suppliers being disrupted simultaneously :

$$P(n) = S + (1 - S)U^n$$

S = probability of a "super-event" disrupting all suppliers imultaneously
 U = probability of a "unique-event" disrupting only one supplier
 L = financial loss incurred in a supply chain if all suppliers were disrupted
 C = marginal cost of managing a supplier

- All suppliers will be disrupted simultaneously
- = if either the super-event occurs oR the super-event does not occur but a unique-event occurs for all of the suppliers.

As the probability of a super-event (S) increases

- the advantage of utilizing multiple suppliers diminishes
- large values of the unique event (U) increase the likelihood of needing more suppliers
- two phenomena taken together suggest that when multiple suppliers are used, managers may consider using ones that are geographically dispersed to lessen the probability of all failing simultaneously.
- = decision tree can be used to help operations managers make this important decision regarding number of suppliers.

Managing the Bullwhip effect

Demand forecast updating, order batching, price fluctuations , and shortage gaming can all produce inaccurate information, resulting in distortions and fluctuations in the supply chain and causing the *bullwhip effect* .

Bullwhip effect

- The increasing fluctuation in orders that often occurs as orders move through the supply chain.
- "Bullwhip" fluctuations create unstable production schedules
- resulting in expensive capacity change adjustments such as overtime, subcontracting, extra inventory, backorders, hiring and laying off of workers, equipment additions, equipment underutilization, longer lead times, or obsolescence of overproduced item
- bullwhip effect can occur when orders decrease as well as when they increase
- often the human tendency to overreact to stimuli causes managers to make decisions that exacerbate the phenomenon

The overarching solution to the bullwhip effect is simply for supply chain members to share information and work together.

Specific remedies for the four primary causes include:

- Demand forecast errors S Share demand information throughout the chain
- Order batching S Think of the supply chain as one firm when choosing order sizes
- Price fluctuations S Institute everyday low prices
- Shortage gaming S Allocate orders based on past demand

A straightforward way to measure the extent of the bullwhip effect at any link in the supply chain is to calculate the *bullwhip measure* :

$$\text{Bullwhip} = \frac{\text{Variance of orders}}{\text{Variance of demand}} = \frac{\sigma_{\text{orders}}^2}{\sigma_{\text{demand}}^2}$$

Variance amplification (i.e., the bullwhip effect) is present if the bullwhip measure is greater than 1. That means the size of a company's orders fluctuate more than the size of its incoming demand. If the measure equals 1, then no amplification is present. A value less than 1 would imply a *smoothing* or *dampening* scenario as orders move up the supply chain from the retailer toward suppliers.

Supplier Selection Analysis

Choosing suppliers simply based on the lowest bid has become a somewhat rare approach. Various, sometimes competing, factors often play a role in the decision.

- Buyers may consider such supplier characteristics as product quality, delivery speed, delivery reliability, customer service, and financial performance.
- The *factor-weighting* technique simultaneously considers multiple supplier criteria.
- Each factor must be assigned an importance *weight* , and then each potential supplier is *scored* on each factor.
- The weights typically sum to 100%. Factors are scored using the same scale (e.g., 1–10).
- Sometimes a key is provided for supplier raters that converts qualitative ratings into numerical scores (e.g., "Very good" = 8)

Transportation Mode Analysis

The longer a product is in transit, the longer the firm has its money invested. But faster shipping is usually more expensive than slow shipping. A simple way to obtain some insight into this trade-off is to evaluate holding cost against shipping options.

Daily cost of holding the product:

$$(\text{Annual holding cost} \times \text{Product value}) / 365$$

There are many other considerations beyond holding vs. shipping costs when choosing the appropriate transportation mode and carrier, including ensuring *on-time delivery* (whether fast or slow), coordinating shipments to maintain a schedule, getting a new product to market, and keeping a customer happy. Estimates of these other costs can be added to the estimate of the daily holding cost.

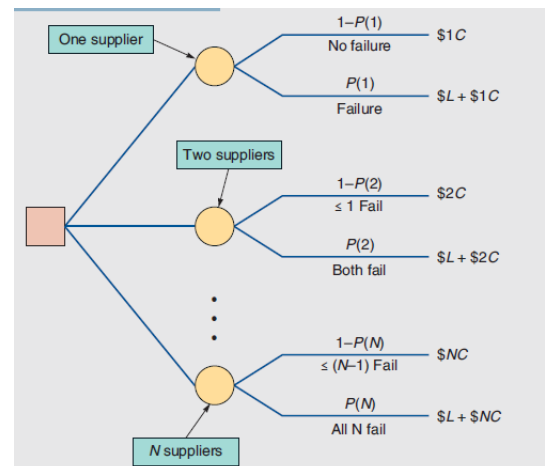
Warehouse storage

When determining storage locations for items in a warehouse, rank the items according to the ratio:

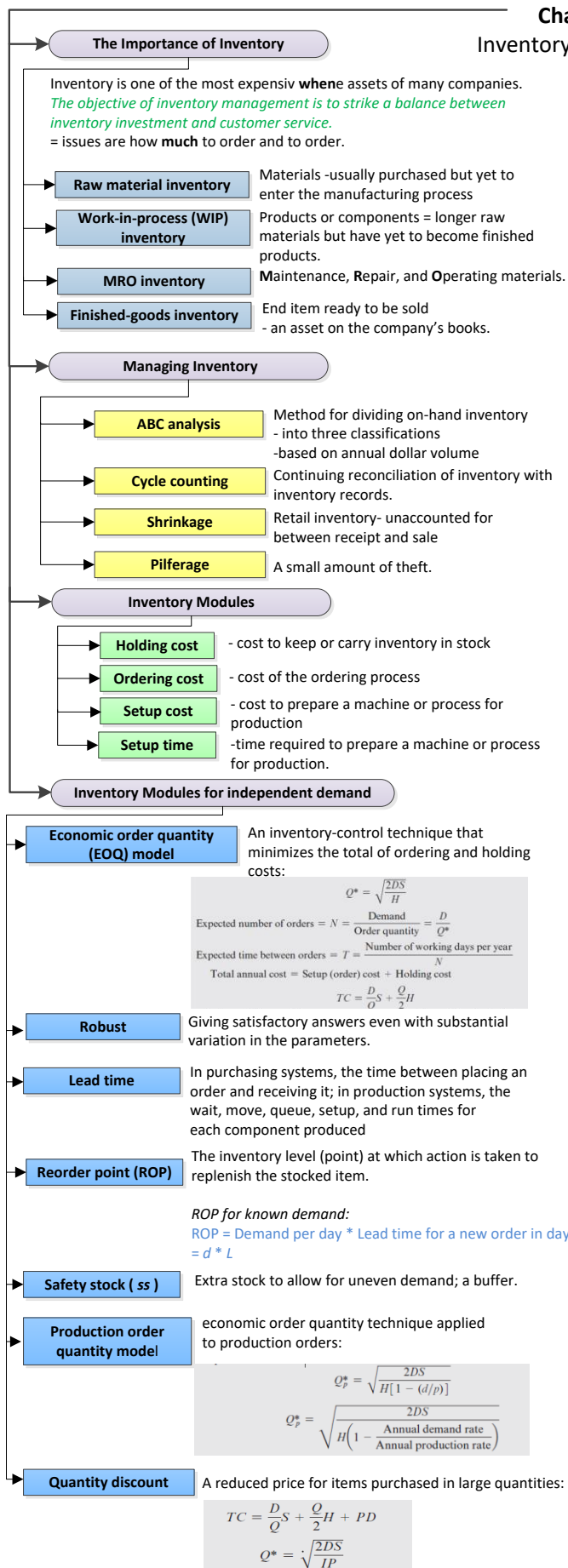
(Number of trips / Blocks of storage needed)

Place the items with the *highest* ratios closest to the dock.

Evaluating Disaster Risk in Supply Chain



Chapter 12 Inventory Management



Probabilistic Models and Safety Stock

Raw material inventory

A statistical model applicable when product demand or any other variable is not known but can be specified by means of a probability distribution.

Service level

The complement of the probability of a stockout.
ROP for unknown demand:

$$ROP = d \times L + ss \quad (12-11)$$

Annual stockout costs = The sum of the units short for each demand level
 $\times$ The probability of that demand level $\times$ The stockout cost/unit $\times$ The number of orders per year $\quad (12-12)$

ROP for unknown demand and given service level:
 $ROP = \text{Expected demand during lead time} + Z\sigma_{dLT} \quad (12-13)$
 $\text{Safety stock} = Z\sigma_{dLT} \quad (12-14)$

ROP for variable demand and constant lead time:
 $ROP = (\text{Average daily demand} \times \text{Lead time in days}) + Z\sigma_{dLT} \quad (12-15)$

ROP for constant demand and variable lead time:
 $ROP = (\text{Daily demand} \times \text{Average lead time in days}) + Z \times \text{Daily demand} \times \sigma_{LT} \quad (12-16)$

ROP for variable demand and variable lead time:
 $ROP = (\text{Average daily demand} \times \text{Average lead time in days}) + Z\sigma_{dLT} \quad (12-17)$

In each case, $\sigma_{dLT} = \sqrt{(\text{Average lead time} \times \sigma_d^2) + d^2 \sigma_{LT}^2}$
 but under constant demand: $\sigma_d^2 = 0$,
 and under constant lead time: $\sigma_{LT}^2 = 0$.

Single-Period Model

Single-period inventory model

A system for ordering items that have little or no value at the end of the sales period:

$$\text{Service level} = \frac{C_s}{C_s + C_o}$$

Fixed-Period Systems

Fixed-quantity (Q) system

- ordering system with the same order amount each time.

Perpetual inventory system

- system that keeps track of each withdrawal or addition to inventory continuously, so records are always current.

Fixed-period (P) system

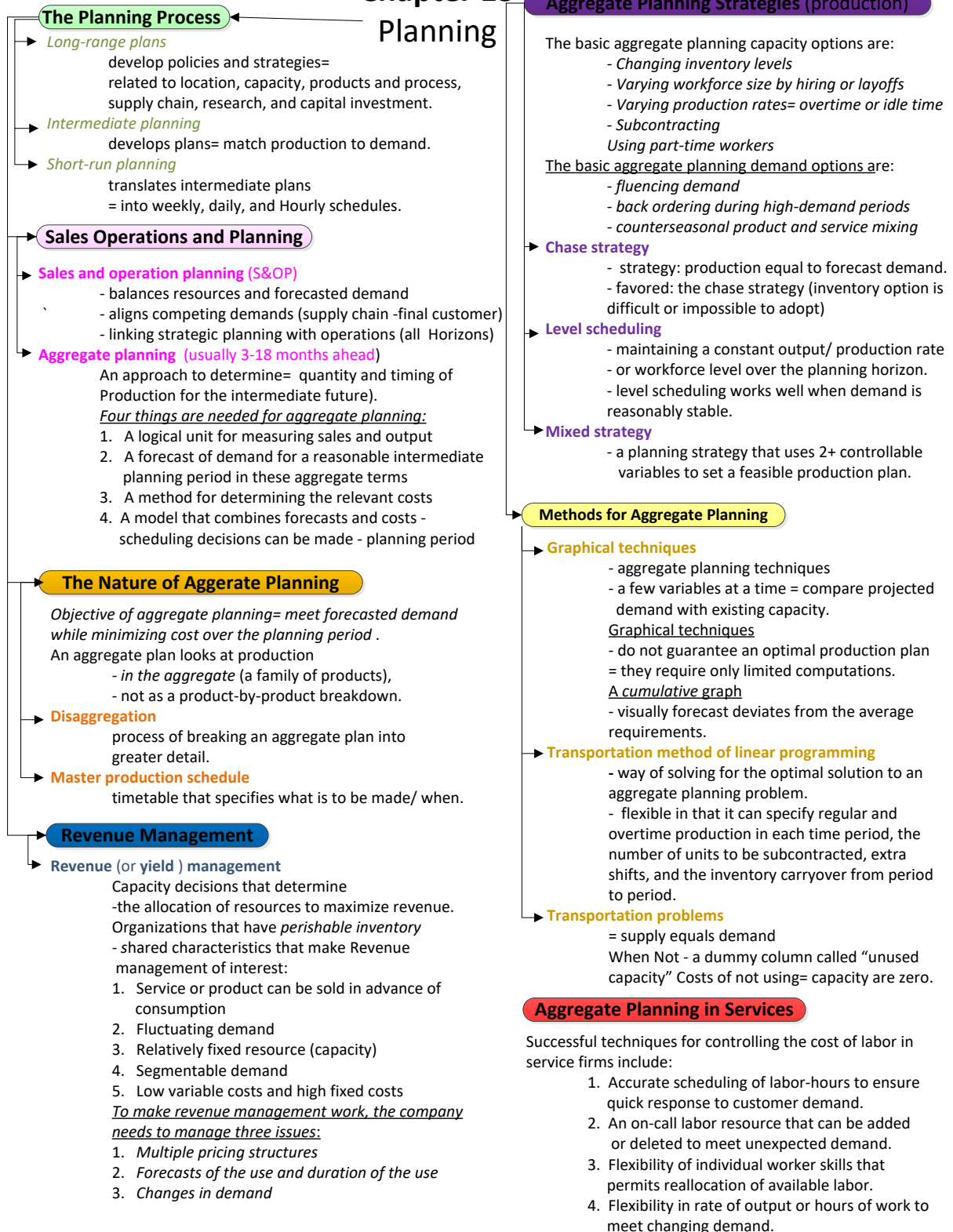
- system in which inventory orders are made at regular time intervals.

7.4 Contact Session 5

Individual submission: Contact session: 5

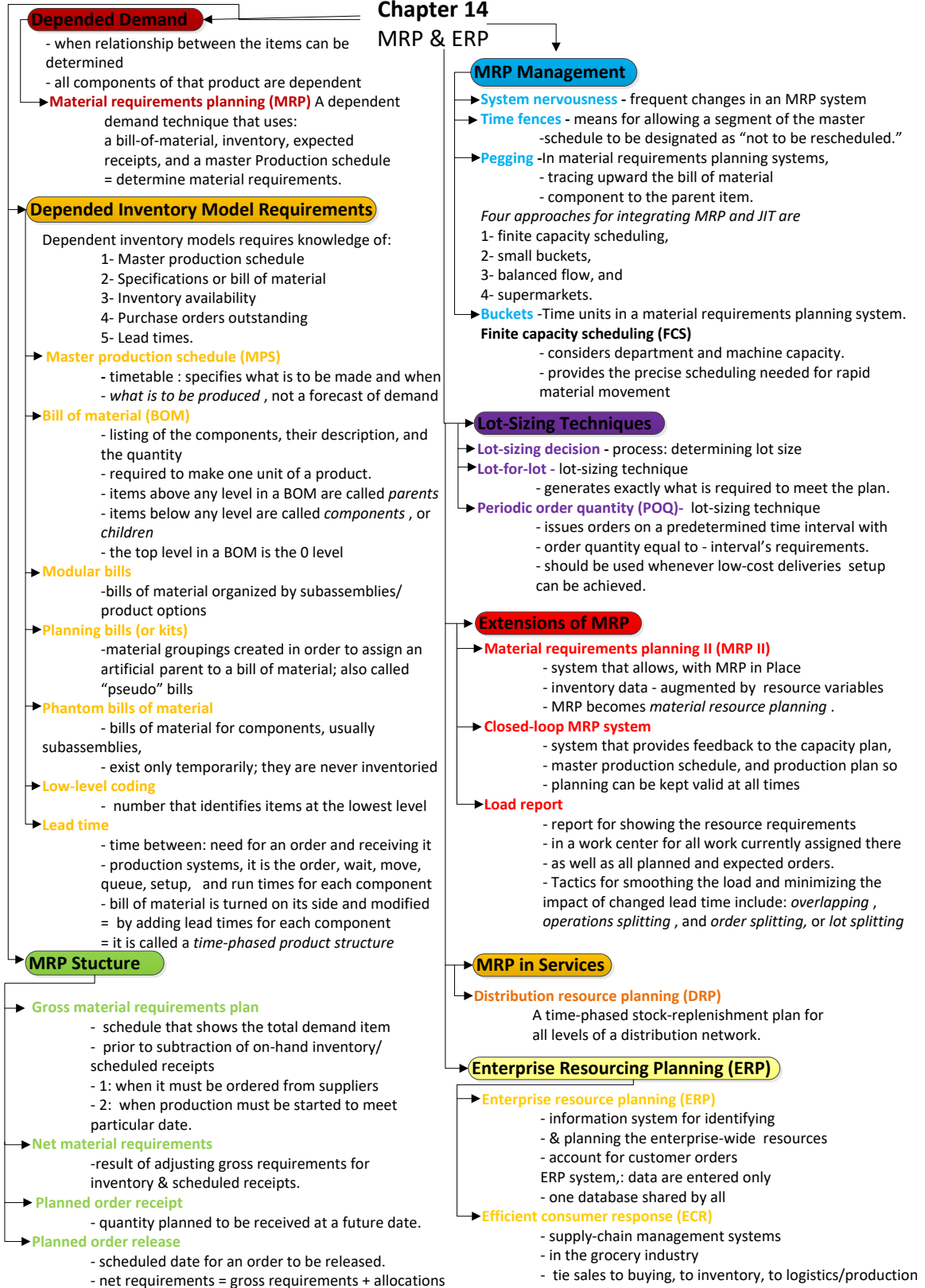
Topic(s): Planning, Scheduling, and MRP & ERP processes (Heizer, Render and Munson, 2016)

Chapter 13 Planning



Chapter 14

MRP & ERP



Chapter 15 Scheduling

The Importance of Short- Term Scheduling

The strategic importance of scheduling is clear:

- **Effective scheduling** means *faster movement* of goods and services through a facility. This means greater use of assets and hence greater capacity per dollar invested, which, in turn, *lowers cost*.
- **Added capacity**, faster throughput, and the related flexibility mean better customer service through *faster delivery*.
- **Good scheduling** contributes to realistic commitments, hence *dependable delivery*.

Scheduling issues

The objective of scheduling= *allocate and prioritize demand*

- **Forward scheduling**
begins the schedule as - requirements are known
- **Backward scheduling**
begins with the due date by scheduling the final operation first and the other job steps in reverse order.
- **Loading**

The assigning of jobs to work or processing centers.

The four scheduling criteria are:

- 1- minimize completion time
- 2- maximize utilization
- 3- minimize work-in-process (WIP) Inventory
- 4- minimize customer waiting time

Scheduling Process- Focused Facilities

A process-focused facility is a high-variety, low-volume system commonly found in manufacturing and services. It is also called an intermittent, or job shop, facility.

Loading Jobs

- **Input-output control** A system that allows operations personnel to manage Facility work flows by tracking work added to a work center and its work completed.
- **ConWIP cards** Cards that control the amount of work in a work center, aiding input/output control. ConWIP is an acronym for *constant work-in-process*. A ConWIP card travels with a job (or batch) through the work center. When the job is finished, the card is released and returned to the initial workstation, authorizing the entry of a new batch into the work center.
- **Gantt charts** Planning charts used to schedule resources and allocate time. The Gantt *load chart* shows the loading and idle times of several departments, machines, or facilities. It displays the relative workloads in the system so that the manager knows what adjustments are appropriate.
The Gantt *schedule chart* is used to monitor jobs in progress (and is also used for project scheduling). It indicates which jobs are on schedule and which are A head of or behind schedule.
- **Assignment method** A special class of linear programming models that Involves assigning tasks or jobs to resources. In assignment problems, only one job (or worker) is assigned to one machine (or project). The assignment method involves adding and subtracting appropriate numbers in the table to find the lowest *opportunity cost* for each assignment.

Sequencing Jobs

- **Sequencing**
- order in which jobs should be done
- **Priority rules**
- Rules used to determine the sequence of jobs
- **First come, first served (FCFS)**
- Completed Jobs - order they arrived.
- **Shortest processing time (SPT)**
- Jobs- the shortest processing times assigned 1st
- **Earliest due date**
Earliest due date jobs are performed first.
- **Longest processing time (LPT)**
Jobs - longest processing time are completed 1st

$$\text{Average completion time} = \frac{\text{Sum of total flow time}}{\text{Number of jobs}}$$

$$\text{Utilization metric} = \frac{\text{Total job work (processing) time}}{\text{Sum of total flow time}}$$

$$\text{Average number of jobs in the system} = \frac{\text{Sum of total flow time}}{\text{Total job work (processing) time}}$$

$$\text{Average job lateness} = \frac{\text{Total late days}}{\text{Number of jobs}}$$

$$\text{Job lateness} = \text{Max}\{0, \text{yesterday} + \text{flow time} - \text{due date}\}$$

- **SPT** is the best technique for minimizing job flow and average number of jobs in the system.
- **FCFS** performs about average on most criteria, and it appears fair to customers.
- **EDD** minimizes maximum tardiness.
- **Flow time** The time each job spends waiting plus the time being processed.
- **Critical ratio (CR)** A sequencing rule that is an index number computed by dividing the time remaining until due date by the work time remaining:

$$\text{CR} = \frac{\text{Time remaining}}{\text{Workdays remaining}} = \frac{\text{Due date} - \text{Today's date}}{\text{Work (lead) time remaining}}$$

As opposed to the priority rules, the critical ratio is dynamic and easily updated. It tends to perform better than FCFS, SPT, EDD, or LPT on the average job lateness criterion.

- **Johnson's rule** An approach that minimizes processing time for sequencing a group of jobs through two work centers while minimizing total idle time in the work centers.
Rule-based scheduling systems have the following limitations:
 - 1- scheduling is dynamic
 - 2- rules do not look upstream or downstream
 - 3- rules do not look beyond due dates.

Finite Capacity Scheduling (FCS)

- **Finite capacity scheduling (FCS)** Computerized short-term scheduling that overcomes the disadvantage of rule-based systems by providing the user with graphical interactive computing.

Scheduling Services

Cyclical scheduling with inconsistent staffing needs is often the case in services.
The objective focuses on developing a schedule with the minimum number of workers. In these cases, each employee is assigned to a shift and has time off.

Nature of business:

C-Gov is a department in the NWU, which offers formal, as well as skills development courses to individuals who work in the Public Sector.

Contact session: How is this theory is applied in the organization at present.**Scheduling:**

C-Gov is a service department. Therefore their service system differs from a manufacturing approach. The focus is placed on scheduling staff, learners and physical attributes for example venues and study material. They seldom maintain inventories. The labour intensiveness varies during different periods of the scheduling. As indicated in the theory, social and behavioural scheduling is important – as this may lead to customer satisfaction.

C-Gov manages the arrangement of their training sessions by managing term related schedules. This allows the department to have a competitive advantage. It also allows the coordinator to plan in advance in order to lower costs. By managing a good schedule, reliable outcomes can be expected.

Planning and scheduling allow the coordinator to deal with operational issues in a timely manner. For example, if textbooks for the class need to be imported, a long time should be provided in order to receive the books. This, for example, must be ordered at least ten weeks before the session, where the printing of study-guides only a two week time period are needed. Scheduling allows the coordinator of the session to prioritize demands.

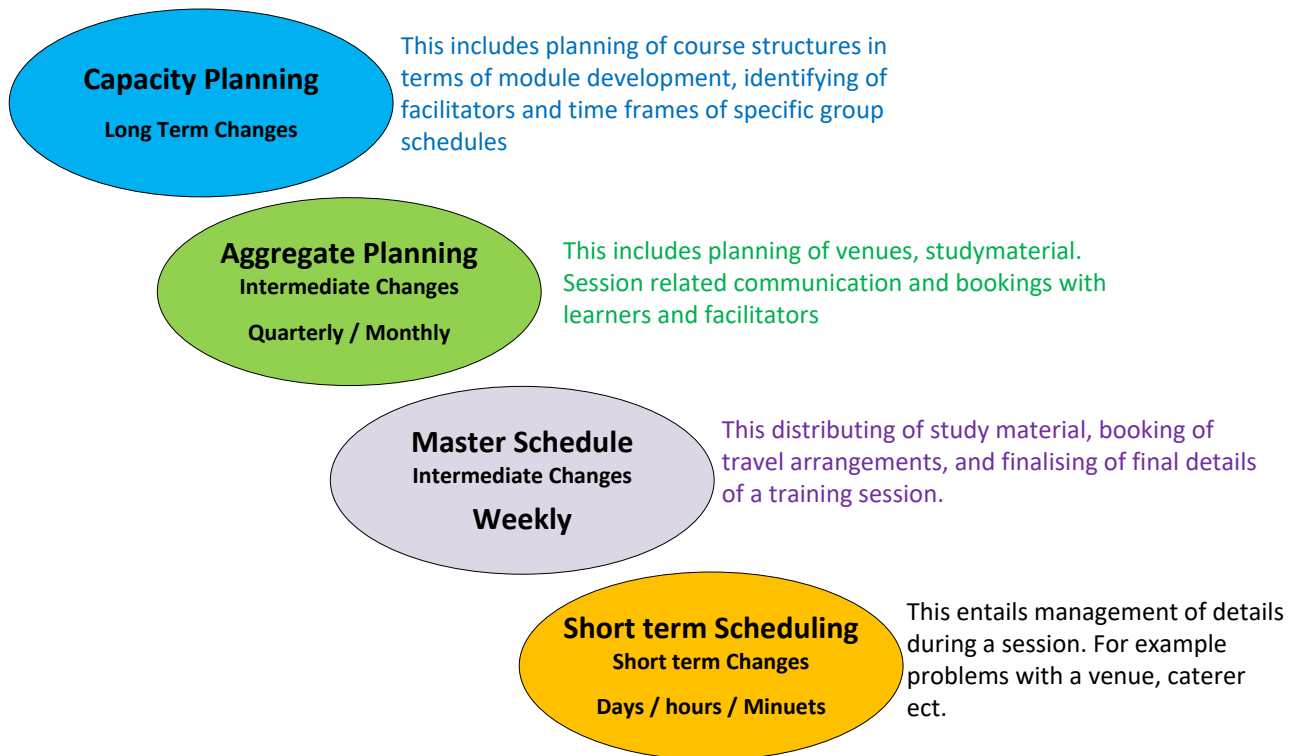
C-Gov approaches scheduling within “work cells”. This allows a coordinator to make use of forward-looking scheduling, determine MRP due dates, as well as allow a coordinator to determine a detailed work schedule using work cell priority rules. A typical work cell cluster will be as follows as indicated in Figure 1. As seen the schedule is broken down in four work cells, each related to specific time frames NL:

- Capacity Planning- Long Term Changes
- Aggregate Planning- Intermediate Changes (Quarterly / Monthly)
- Master Schedule- Intermediate Changes (Weekly)
- Short term Scheduling- Short term changes Days (Hours / Minutes)

This time frame “work cells” works well for this department. The only suggestion is that I can suggest, is that these work cells must be aligned/incorporated with other procedures, for example, quality management, project and material management. This will allow better control over processes as well as the consistency of outcomes from all coordinators.

Figure 1 (Heizer, Render and Munson, 2016)

C-Gov Scheduling Flow



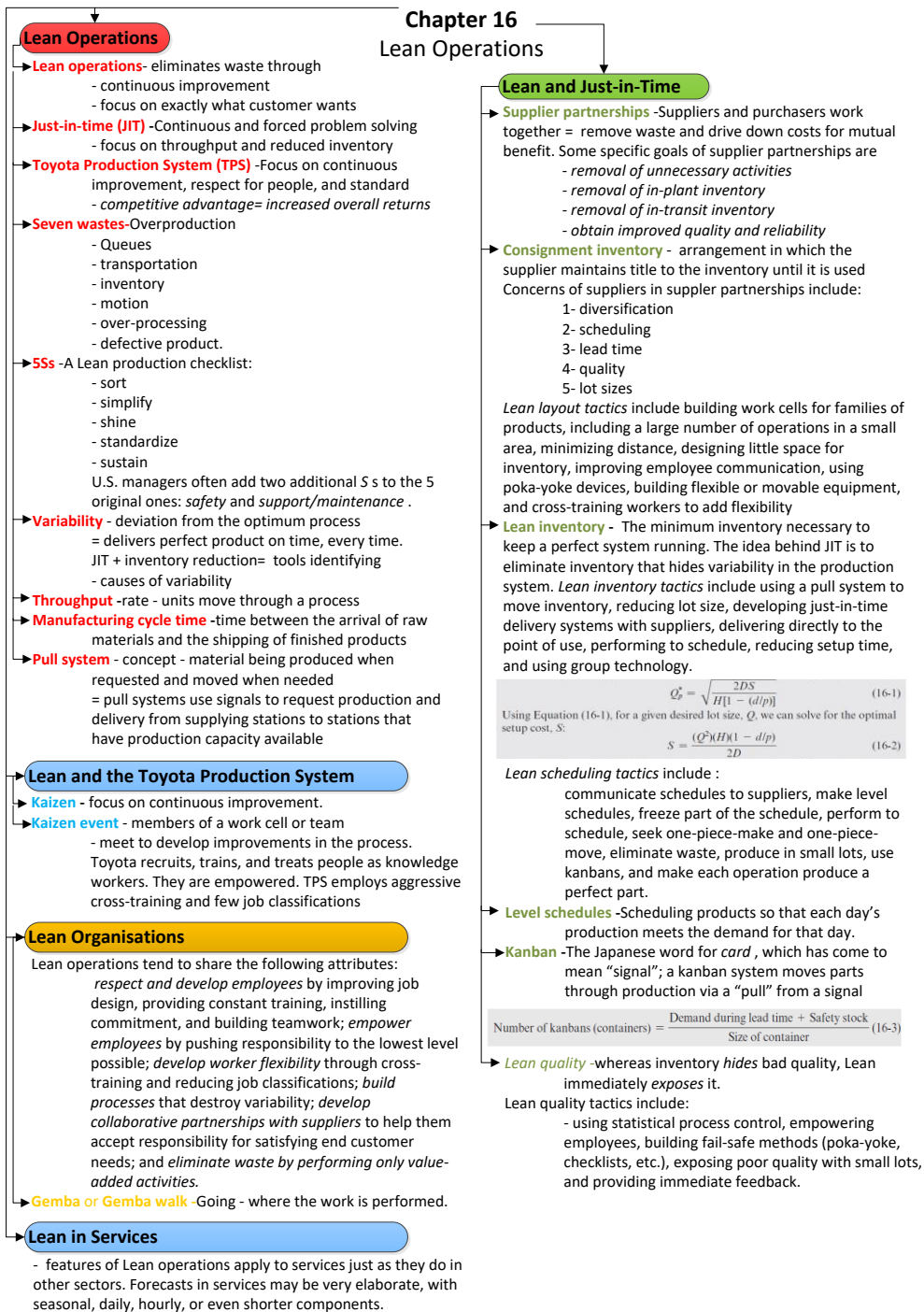
What is there about the topic that I would like explained further in class?

None, thank you.

Contact Session 6

Individual submission: Contact session:

Topic(s): Lean Operations (Heizer, Render and Munson, 2016)



Chapter 17

Maintenance and Reliability

The Strategic importance

Poor maintenance can be disruptive, inconvenient, wasteful, and expensive in dollars and even in lives. The interdependency of operator, machine, and mechanic is a hallmark of successful maintenance and reliability. Good maintenance and reliability management requires employee involvement and good procedures; it enhances a firm's performance and protects its investment. *The objective of maintenance and reliability is to maintain the capability of the system.*

- **Maintenance** - activities involved in keeping a system's equipment in working order.
- **Reliability** - The probability that a machine part or product will function properly for a specified time under stated conditions.
- The two main tactics for improving reliability are:
 1. Improving individual components
 2. Providing redundancy
- The two main tactics for improving maintenance are:
 1. Implementing or improving preventive maintenance
 2. Increasing repair capabilities or speed

Reliability

A system is composed of a series of individual interrelated components, each performing a specific job. If any *one* component fails to perform, the overall system can fail.

As the number of components in a *series* increases, the reliability of the whole system declines very quickly:

$$R_s = R_1 \times R_2 \times R_3 \times \dots \times R_n$$

where R_1 is reliability of component 1, R_2 is reliability of component 2, and so on. Equation (17-1) assumes that the reliability of an individual component does not depend on the reliability of other components.

A .90 reliability means that the unit will perform as intended 90% of the time, and it will fail 10% of the time.

The basic unit of measure for reliability is the *product failure rate* (FR). FR(%) is the percent of failures among the total number of products tested, and FR(N) is the number of failures during a period of time:

$$FR(\%) = \frac{\text{Number of failures}}{\text{Number of units tested}} \times 100\%$$

$$FR(N) = \frac{\text{Number of failures}}{\text{Number of unit-hours of operating time}}$$

- **Mean time between failures (MTBF)** - expected time between a repair and the next failure of a component, machine, process, or product. **MTBF = 1 / FR(N)**
- **Redundancy** - use of components in parallel to raise reliability. The reliability of a component along with its backup equals:

$$\text{Reliability of a component along with its backup equals:} \\ (\text{Probability that 1st component works}) + [(\text{Prob. that backup works}) \\ \times (\text{Prob. that 1st fails})]$$

Maintenance

- **Preventive maintenance** - Involves routine inspections, monitoring, servicing, and keeping facilities in good repair.
- **Breakdown maintenance** - Remedial maintenance that occurs when preventive maintenance fails and equipment/facilities must be repaired on an Emergency or priority basis.
- **Infant mortality** - The failure rate early in the life of a product or process. Consistent with job enrichment practices, machine operators must be held responsible for preventive maintenance of their own equipment and tools. Reliability and maintenance are of such importance that most Maintenance systems are now computerized.
- Costs of a breakdown that may get ignored include:
 1. The cost of inventory maintained to compensate for downtime
 2. Downtime, which can have a devastating effect on safety and morale and which adversely affects delivery schedules, destroying customer relations and future sales
- **Autonomous maintenance** - Operators partner with maintenance personnel to observe, check, adjust, clean, and notify. Employees can predict failures, prevent breakdowns, and prolong equipment life. With autonomous maintenance, the manager is making a step toward both employee empowerment and maintaining system performance.

Total Productive Maintenance

- **Total productive maintenance (TPM)**
 - Combines total quality management with a strategic view of maintenance from process and equipment design to preventive maintenance.
 - Total productive maintenance includes:
 - 1- Designing machines that are reliable, easy to operate, and easy to maintain
 - 2- Emphasizing total cost of ownership when purchasing machines, so that service and maintenance are included in the cost
 - 3- Developing preventive maintenance plans that utilize the best practices of operators, maintenance departments, and depot service
 - 4- Training for autonomous maintenance so operators maintain their own Machines and partner with maintenance personnel
- Three techniques that have proven beneficial to effective maintenance are simulation, expert systems, and sensors.

8 Annexures

8.1 Annexure A: Course Schedule:



Course Schedule 2019 (PGPM04)
Postgraduate Diploma in Public Management / 1BC D01 - L501P

Module		Orientation	First Semester			Second Semester		
			PGPM523 (PTR) Public Sector Transformation and Reform	PGPM517 (PPM) Programme and Project Management in the Public Sector	PGPM521 (HRM) Advanced Human Resource Management in the Public Sector	PGPM518 (PME) Public Sector Planning, Monitoring and Evaluation	PGPM519 (GML) Governance, Public Management and African Leadership	PGPM522 (FMB) Advanced Public Financial Management and Budgeting
Online	Course material available online	n/a	6 Feb 2019	20 March 2019	1 May 2019	12 June 2019	24 July 2019	4 Sept 2019
Contact Session Information	Contact session	19 Feb 2018	20-22 Feb 2019	3-5 April 2019	15-17 May 2019	26-28 June 2019	6-8 Aug 2019	18-20 Sept 2019
	Venue	Orientation & Assignment Writing: Kumakani Country Lodge, Potchefstroom	Kumakani Country Lodge, Potchefstroom	Kumakani Country Lodge, Potchefstroom	Kumakani Country Lodge, Potchefstroom	Kumakani Country Lodge, Potchefstroom	Kumakani Country Lodge, Potchefstroom	Kumakani Country Lodge, Potchefstroom
		e-Learning: NWU Library (Open/Local Lab)						
	Contact Session Facilitator (CSF)	Orientation & Assignment Writing: Mr Willem Mostert	Adv Marilize Kruger	Mr Andre Knipe	TBC	Prof Costa Hofisi	Prof Barry Hanyane	Mr Faan Pelser
		e-Learning: Ms Marië Moolman						
	Module Coordinator (MC)	n/a	Adv Marilize Kruger	Mr Andre Knipe	TBC	Prof Costa Hofisi	Prof Barry Hanyane	Mr Faan Pelser
Formative Assignment (FA)	FA is due (23:55)		4 March 2019	15 April 2019	27 May 2019	8 July 2019	19 Aug 2019	30 Sept 2019
	FA (Late Submission) (23:55)		11 March 2019	23 April 2019	3 June 2019	15 July 2019	26 Aug 2019	7 Oct 2019
	Marker Due Date		18 March 2019	29 April 2019	10 June 2019	22 July 2019	2 Sept 2019	14 Oct 2019
	FA Marks available		19 March 2019	30 April 2019	11 June 2019	23 July 2019	3 Sept 2019	15 Oct 2019
Summative Assignment (SA)	SA Admission for Turn-In Report (23:55)		25 March 2019	8 May 2019	19 June 2019	31 July 2019	11 Sep 2019	23 Oct 2019
	Final SA is due (23:55)		1 April 2019	13 May 2019	24 June 2019	5 Aug 2019	16 Sept 2019	28 Oct 2019
	SA (Late Submission) (23:55)		8 April 2019	20 May 2019	1 July 2019	12 Aug 2019	23 Sept 2019	4 Nov 2019
	Marker due date		22 April 2019	3 June 2019	15 July 2019	26 Aug 2019	7 Oct 2019	18 Nov 2019
	Moderator due date		29 April 2019	10 June 2019	22 July 2019	2 Sept 2019	14 Oct 2019	25 Oct 2019
Final Marks	Final Marks available for learners		7 May 2019	18 June 2019	20 July 2019	10 Sep 2019	22 Oct 2019	3 Dec 2019

Course Schedule PGPM04 2019 (L501P) / 16 January 2019 / TB

Module - Learner Evaluation Questionnaire

Date: _____ Facilitator: _____

Population Group: ☐ A ☐ C ☐ I ☐ W Other _____ Gender: ☐ M ☐ F

Module Name: _____

Employer: _____ Province: _____

A - Overall Result

1. Overall, how would you rate the module?
2. How do you rate the relevance of the module to your work?
3. How well was the power point presentation organized, did it “match” the program and was it aligned to the module material?

1	2	3	4
Excellent	Good	Average	Poor
Excellent	Good	Average	Poor
Excellent	Good	Average	Poor

B – Content

4. How practical was the module content for your workplace?
5. How well was the module material organized and structured?
6. How did you find the learning material?

1	2	3	4
Excellent	Good	Average	Poor
Excellent	Good	Average	Poor
Excellent	Good	Average	Poor

1	2	3	4
---	---	---	---

C – Facilitator

7. How well was the module facilitated?

8. How do you regard the facilitator's presentation expertise?

9. Did the facilitator/presenter demonstrate updated knowledge of Public Service?

10. What other comments do you have about the facilitator/presenter?

Thank you for taking part in this program and for taking the time to give us your feedback.

Excellent	Good	Average	Poor
Excellent	Good	Average	Poor
		Yes	No

8.3 Addendum C: LEP

Learner Programme Evaluation Questionnaire

Module Name: _____

Date: _____

Population Group: ☐ A ☐ C ☐ I ☐ W Other _____ Gender: ☐ M ☐ F

Employer: _____ Province: _____

A – Logistics

1. How well was the event organized In respect of pre-course communication & coordination of the event?
2. Was the venue & facilities conducive for learning?
3. Was the menu up to standard?
4. Was the support received from the Helpdesk (eFundi) professional, efficient and timeous?
5. Was the support received from the Project Office professional, efficient and timeous?

1	2	3	4
Excellent	Good	Average	Poor
Excellent	Good	Average	Poor
Excellent	Good	Average	Poor
Excellent	Good	Average	Poor
Excellent	Good	Average	Poor

B – How you chose this program

1. Where did you learn about this program?

☐

Course Calendar

☐

Website

☐

Supervisor

☐

Colleague

☐

Brochures

☐

SDF

☐

Radio

☐

Other (specify) _____

2. Why did you attend this program?

☐

Organisational
Performance
Improvement

☐

Enhancing
Personal Skills

☐

Promotion

☐

Other
(please
specify)

3. What other comments do you have about the administration
and logistics of the program?

Thank you for taking part in this program and for taking the time to give us your feedback.

CAR/PAR Audit No	or	«Corrective_Action_Requests_Num ber» «Short_Description» «Month» «Year»	Business Process /Area	«Category» «Type»
SECTION 1: SOURCE				
• External Audit • Internal Audit • Customer • Internal Observation • Management Review			• Regulatory authority • Suggestion Scheme • Public • Other	
SECTION 2: DETAILS OF COMPLAINT/INCIDENT/REQUEST/NON-CONFORMANCE/FINDING & EVIDENCE				
• Customer Requirement • Actual Non-conformity • Potential Non-conformity / Take Note			• Inquiry/Request • Complaint • Appeal	
Provide details: «Provide_details»				
Initiated By:		«Initiated_by»	Date:	«Initiated_Date»
SECTION 3: IMMEDIATE ACTION(S) TAKEN TO MITIGATE EFFECT				
Who	What	Target Date	Date Completed	Initials
«Who__Imm ediate_Actio n»		«Target_Da te__Immed iate_Action »		

SECTION 4: CORRECTIVE and PREVENTIVE ACTION TO PREVENT OCCURRENCE OR RECURRENCE						
Who	What Action planned	Documents to be changed	New Target Date	Date Completed	Initials	
«Who_CorPre ev_Action»			«Target_Date__CorPre v_Action»			
SECTION 5: EFFECTIVENESS REVIEW						
Who	Is/are the arrangement(s) effective? (Yes/No)	Motivation	Additional Controls Required	New Target Date	Date Completed	Initials
SECTION 6: CAR CLEARANCE						
Cleared by		Signature		Date		
COMMENTS						

8.5 Addendum E: Change Request Form

CHANGE REQUEST FORM

Reference No:

CRF

SECTION A: Define the Change and describe the current state		
1. <i>Define what is to be changed:</i> 2. <i>Description of Current State:</i> 		
SECTION B: Motivation		
<i>Provide motivation for the desired change:</i> 		
SECTION C: Define the nature of the change		
<i>Clearly define exactly the nature of the desired change (Describe the desired state):</i> 		
SECTION D: Conduct a Basic Risk Assessment		
A	B	C
Potential Hazards	Classify Hazards (H – High, M – Medium, L – Low)	Remedies to Mitigate Potential Hazards
SECTION E: Documents that require change & Document Owner		
A	B	C
List Documents to be Changed	Document Owner	Sign off of Modification

SECTION F: Consult and Inform of Desired Change		
A List persons that need to be consulted (Discuss described change prior to the request for modification)		B List persons that need to be informed (Notify the identified persons once the change has been approved, including the document owner)
Proponent (Name)	Signature	Date
Form submitted to Quality Officer		Date
Placed on forthcoming Meeting		Date
SECTION G: Approval		
☐ Approved		☐ Not Approved
Manager (Name)	Signature	Date
Review Successful Implementation of Change Request		
Date:		