Structures in a distance education university (DEU)

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1.1 Introduction

What is the focus of the distance education university (DEU)? There are many definitions of what a university is and how it operates. For the purpose of this paper, I use the following definition:

A University is an institution that prepares students to become thinking and educated people within a learning environment. University staff is involved with research efforts to contribute to the knowledge pool through publication activities and is involved in service activities. The university is a monetary entity.

There are different views of an institution. Financial departments would draw and study models to make the institution more financially feasible. Human Resource departments would study the output of different departments to determine human resource needs. Another view is from a product view; to look at the deliverables returned to the community, for example educated students and publications. My focus in this study is on the processes involved, within the learning environment, from a viewpoint of the products delivered by the institution.

During the production cycle of DEU products, a number of components work in harmony to get the desired results. The purpose of this paper is to define the DEU component structure with the focus on the production of the different products in the DEU, and to emphasize the interaction between these components. The environment used as case study for the structure definition of the DEU was the University of South Africa (UNISA), referred to as UNISA in this paper. The discussion starts with a definition of the high-level components in the DEU, followed by a detailed discussion of each of the components.

2 High-level model of the DEU

All DEU have four basic components or entity groups that contain all other activities and systems, namely: support and infrastructures, role players, products and management functions [1].

![Figure 1 : High-level diagram of the DEU](image-url)
The following is a short overview of each of the components:

- **Support and infrastructures** include all the components within the DEU that support the main functions of the university, namely the teaching and learning processes and research activities.
- **Products** are all the measurable components produced by the DEU as output.
- **Role players** are all the people involved in different roles within the university actively involved with learning and teaching activities, support activities or research activities.
- **Management functions** include all the activities by management role players that include decisions on policies, management and structures.

The support and infrastructure, role players, and management function components interact with one another to produce the different products (Figure 2).

![Figure 2: Different components working together to produce products](image)

Each of these components can be broken down into various other components. Figure 3 consist of a breakdown structure of the high-level model depicted in Figure 1 and Figure 2. Each component is broken down into a number of sub-components. For example, the management component includes issues on policies and structures while another component such as products include graduates, course material, research outputs etc.

The focus of this paper is on the processes involved in delivering the various products within the DEU. The production cycle of these products is impossible without the proper support infrastructures. In Section 2.1 the different infrastructures involved in the production cycle are discussed. Concurrent with the infrastructures the role players are also supporting the production cycle of the various products. Section 2.2 discusses the different role players. Section 2.3 consists of the breakdown of products and their production cycle with the relationship defined between the role players and infrastructures. Although this paper does not focus on managerial issues a short overview are given in Section 2.4.
2.1 DEU support and administration infrastructures

The backbone of the DEU is the administration infrastructures, which, with the management of various role players supervise the fluent operation of the university. I differentiate between three infrastructures namely support services, environment support, and systems.

Support services can either be to support students or staff. Some support systems support both students and staff. The infrastructures available to staff are intended to improve their working conditions and include services such as editorial, financial, scheduling, and copying services. The infrastructures available to students should improve their general learning environment and provide additional assistance. Examples include counselling services, bursary services and information services.

Environment Support is the university infrastructures and systems available to students and staff that create a learning environment to enable learning outcomes and create learning products. Examples include the examination support, academic support, telecommunication support and postal support.

Within the DEU Systems can be created to support either staff or students. Staff systems include the hardware and software that create a basic working environment for university staff. Examples include the accounting systems, internal web services and personnel systems. The DEU university also provides student systems to monitor the learning progress and to interact with the learning environment. Examples of student systems are web systems and registration systems.

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1 For a more extensive list of the infrastructures and examples, consult Appendix A.
The three categories of components which forms the infrastructure and support systems, works together with the various role players within the DEU to produce high quality products. In section 2.2, a discussion follows on the different role players within the DEU.

### 2.2 DEU Role Players

A role is any part played by something (e.g. a person, piece of equipment, or organization). A role captures the purpose of something, the position it holds, or its capacity, job, or viewpoint. In general, implementation of roles is as a model role, protocol role, relationship role or a view role [2].

In the production of the various products within the DEU, I use the term *role player* to refer to the active role that a person or group of persons play, in the development cycle of the product.

Categorization of role players is very difficult due to the flexibility of the person involved. A lecturer can play a teaching role in one process and developer in the following process. In future discussions, I will refer to specific roles, except in the high-level diagrams. For clarity, I give a description of the role player terminology used in section 2.3 in the high-level diagrams. On a more detail level, such as the role played by librarian staff, the terminology is self-explanatory.

- **When referring the lecturing staff**, all staff that is involved in the lecturing and teaching processes is included, for example lecturers, markers, assistants and educational technologists.
- **Students** include any person enrolled for a course at the DEU.
- **Admin and support staff** consists of any member of staff involved in the production and support systems at the DEU. Examples include the production staff, despatch staff and library staff.
- **Management staff** includes any person involved on managerial level with decisions affecting the structures and policies within the university.
- The role other refer at a high-level to any role players involved in management functions, infrastructures or products that do not naturally fall within one of the above-mentioned categories. These include researchers, task groups, quality assurance teams and consultants.

Role defining is a ‘human resource problem’ that falls outside the scope of this study. My focus is on the DEU and structures within the university. It is inevitable that any changes of structures will have an impact on role players, thus the different role players involved in the DEU structures cannot be ignored.

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2 A more detail list of examples of role players can be found in Appendix B.


2.3 DEU Products

According to the Cassell concise dictionary [3] a product is defined as something that is produced by natural processes, labour, art or mental application. An extended definition for the DEU product is:

A DEU product is a deliverable of the university and can be a physical product or a measurement of knowledge.

Two of the products delivered by the university are easy distinguishable, namely the delivered graduate and the published research output [4]. There are more products that are sometimes not so easy to identify. One of these, which play a role during the production cycle of the graduate, is course material. Without course material, it is impossible to deliver the graduate as product. The fourth product produced by the university consists out of a range of material used to promote the activities at the university. Without promoting the university and the programmes available at the institution, student numbers can drop. The last products are products with a commercial value. Commercial products include any product sold in the open market either to generate revenue on a profit-base or to cover the development cost of the product. A detail discussion of the five different products is included in section 2.2.1 to 2.2.5.

2.3.1 Course Material product

At the DEU, course material is the backbone supporting the different teaching and learning processes. Course material services as information tool, communication tool and partially replaces the traditional classroom meeting between the learner and the lecturer. It is prepared with the co-operation of different role players from the environmental support, student systems and the staff support components.

Role players from the environment support component are responsible for the duplication and distribution of the course material while the student system gives access to distribution information. During production of course material the staff support systems are used to help with the different activities involved in producing the particular product (Figure 4).

![Figure 4: Infrastructures and course material](image-url)
If I look at the course material in more detail, I can identify two sub-components and two processes that are involved:

- The type of product developed (sub-component).
- The kind of teaching and learning processes involved with the product (process).
- The production cycle that is involved in development of the product (process).
- The role players that is involved in the production of the product (sub-component).

In Figure 5 the relationship between the sub-components and processes are depicted.

![Figure 5: Relationship diagram for course material product](image)

In Figure 6 you will find a more detailed diagram of Figure 5 followed by a short explanation of each of the processes or sub-components.

![Figure 6: Components in the production of course material product](image)

*Production cycle*

The DEU follows a group development approach that makes an organized production cycle inevitable. The production cycle of course material products consist of five activities namely product proposal, planning, an awareness process, a development cycle and finally the distribution of the product. The detail of the processes within each phase differs according to the type of product. For example, the distribution phase methods for publishing a web page will differ from the methods used in a radio broadcast.
Course Material

Course material includes all educational items used by the DEU during the teaching and learning processes. The DEU develops course material in-house or buy it from external parties. There are four sub-categories of course material products: web-based material, paper-based material, multi-media, and broadcasting products.

- **Multimedia material** is software and applications that combine text, high quality sound, graphics, and animation or video [5]. Examples of multimedia products that are used by the DEU include compressed video and audio, graphics, computer-assistance educational software, interactive software, interactive tests, electronic books, and transparencies.

- **Web-based material** is any material developed or used by the instructor with the web as communication medium. Examples include bulletin boards, electronic mail, static / dynamic web pages, chat, virtual worlds, newsgroups, downloadable electronic material with text, graphics, video and sound, interactive educational web pages, exams / tests, and electronic books.

- **Paper-based material** is material that is printed and duplicated on a paper medium. The paper-based material is distributed to the student or prescribed for the students own account. Examples include books, printed tutorial letters, exam papers, photos and posters.

- **Broadcasting material** is material that uses transmission mechanisms to distribute course material or discuss subject related issues. Examples include television broadcast, videoconference, television conference, tape, and video.

Teaching and learning processes

The components involved in the teaching and learning processes include learning activities, course communication, assignments and examinations. The working of these components relies heavily on the different course material products defined previously. Without the different course material products, the teaching and learning processes will not function efficiently within the DEU. The structure of the components will differ from course to course. One lecturer may prefer to use the open book object from the examination class while another may prefer a close book object for examination.

Role players

It is impossible for the DEU to function without people. Each person works at the DEU in a certain capacity with certain responsibilities. I use the term role player to refer to person involved in a component. For example, despatch staff has the despatch function as responsibility within the distribution component. The role player in this scenario is the despatch staff. Staff working at the DEU is involved in one or more roles, while the student can also be involved in various roles (e.g. lecturer and student).

The relationship between the different role players and the production team as well as the learning and teaching component are important in defining the structures of the DEU. I use a cross-section table to indicate the relationship between the role players and the production cycle (table 1) as well as the teaching and learning processes (table 2).
Table 1: Relationship between role players and production cycle components

In the production cycle, the educational technologist plays a role in the planning, awareness process and development component. The quality assurance team will be involved in the development component while despatch staff is only involved in the distribution component. Lecturers are involved in all the components of the production cycle, except in the distribution component. Production staff helps in the planning process, could be involved in the awareness process and helps during the development process. Library staff is involved in the planning and development cycle.

Table 2: Relationship between role players, infrastructure role players and teaching and learning processes

The learning and teaching processes is the core of the university. In table 2 a cross-reference table depict the relationship between the learning and teaching processes and the different role players. Except for the library staff that is only involved in the learning activity and the student that is uninvolved in the assignment component, all the other role players are actively involved in the different learning and teaching processes.

2.3.2 Research Output product

According to Arthur Hobbs [4] the second dimension of a university is the building of knowledge or research. Part of the mission statement of most universities is to conduct quality research [6][7][8]. According to the concise dictionary research is a systematic study of phenomena [3]. For the purpose of My study, I use the following definition:

When research is done, a systematic investigation approach is followed which include research development, testing and evaluation, to contribute to the collection of knowledge.
The research product is the deliverable produced by the research activities in the DEU.

*A research product is defined as any output generated from research activities.*

Role players from all the infrastructures component categories are involved in the production cycle of a research product (Figure 7).

![Figure 7: Infrastructures and research product](image)

The different infrastructures support the activities in research to produce a research product ready for distribution to the world. For each research product produced within the DEU, the type of product determines the detail in the production cycle. The type of product is not the only component of importance; there are also a number of role players involved in the production of a research product (Figure 8).

![Figure 8: Components in the production of research product](image)

Research products are the deliverables of a research production cycle that could differ depending on the type of product. I give a short description of each of the research products.
Product Description

Publication
A publication is an article published in an academic journal.

Thesis
An essay or dissertation submitted by a candidate for a masters or doctoral degree.

Conference presentation
A conference presentation is a verbal report on a subject, which can include illustrative material, at a conference meeting.

Artefacts
An artefact is a product of human skill or workmanship.

Prototype
A prototype is a pre-production model used for testing to trace design faults or to indicate improvements.

Technical report
A technical report is a report used to give an account of a specific subject using or requiring specialist knowledge.

Literature review
A literature review is a summary on a specific topic giving an overview including information and resources on research already done, current state of affairs and research opportunities in the field.

As already stated, the research cycle of each product can be different. On a high-level, it consists of a proposal, research cycle, and submission of the product. After submission, a revision is possible where the researcher is once again involved in the research cycle.

I use a cross-section table to indicate the relationship of the different role players and the production process (table 3).

<table>
<thead>
<tr>
<th>Role players</th>
<th>New Proposal</th>
<th>Research cycle</th>
<th>Submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Assurance team</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lecturing staff</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Production staff</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Library staff</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Student</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Table 3: Relationship between role players and production cycle components

2.3.3 Graduate as product of the DEU

The graduate that finishes a diploma, certificate or degree at a DEU is a deliverable of the University. In order to be successful in the education process of a graduate, the institution needs interaction between all the support and admin infrastructures, as demonstrated in Figure 9.

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3 Student or library staff plays a role in the New proposal and the Submission of the production cycle only if the researcher is a student or member of the librarian staff.
The graduate instruction cycle begins with the registration of a student for a particular degree, diploma or certificate. The student goes through a learning cycle, with one or many assessment milestones. A graduation follows the successful completion of all the modules needed for the degree, diploma or certificate.

A number of role players are involved in the instruction of a graduate. In table 4 a cross-section table is given to indicate the relationship between the different phases in the instruction process and the role players.

<table>
<thead>
<tr>
<th>Role players</th>
<th>Instruction Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Registration</td>
</tr>
<tr>
<td>Quality assurance team</td>
<td></td>
</tr>
<tr>
<td>Despatch staff</td>
<td></td>
</tr>
<tr>
<td>Lecturing staff</td>
<td></td>
</tr>
<tr>
<td>Production staff</td>
<td></td>
</tr>
<tr>
<td>Library staff</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td></td>
</tr>
<tr>
<td>Admin &amp; support staff</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Relationship between role players and instruction cycle components
An observation that comes naturally from the cross-section table is the important role that admin and support staff plays throughout the total instruction cycle in the DEU.

### 2.3.4 Promotional products

There is a famous statement in the business world:

*What happens when you do not advertise - Nothing!* (Author unknown.)

The university cannot neglect to promote the institution actively for a number of reasons. The growing market of private institutions competing for the student market is one of the main reasons. Another important factor is the tendency of governments to cut down on subsidies per student, which lead to bigger classes to make courses economically feasible.

One sub-component of products at the DEU is information or promotional material for example information brochures used at registration. In producing these products, the environment support structure and the staff support services plays an important supporting role (Figure 11).

![Figure 11: Infrastructures supporting the promotional product](image-url)

I sub-divide the promotional product into two categories, those that are involved with promoting the institution, namely advertisement based products, and information resource based material. Advertisements include materials such as radio broadcasts, newspaper publications, and posters. Information resources include brochures, booklets and web-based material (Figure 12).

There are four phases in the development cycle of the promotional product. The responsible role players propose a new product and after approval, the planning cycle begins. The development cycle follows the planning cycle. If problems exist within the development cycle, the team return to the planning cycle to re-evaluate the possible solutions. After the final stages in the development cycle, the quality control look for errors before the distribution cycle begins.
The role players involved in the production of a promotion product include the marketing team with help from academic departments that knows the content of the various courses. Table 5 consist of a cross-reference table to indicate the relationship between the different role players and the production cycle of the promotional product.

![Production cycle diagram]

**Table 5: Relationship between role players and promotional product production cycle**

<table>
<thead>
<tr>
<th>Role players</th>
<th>Production cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing team</td>
<td>New Proposal</td>
</tr>
<tr>
<td>Despatch staff</td>
<td></td>
</tr>
<tr>
<td>Academic staff</td>
<td></td>
</tr>
<tr>
<td>Production staff</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td></td>
</tr>
<tr>
<td>Information Centrum</td>
<td></td>
</tr>
</tbody>
</table>

**2.3.5 Commercial product**

A commercial product is a product produced by University staff and after completion placed in the open market as a profitable product. The aim of the product was not necessarily in the beginning to generate revenue, but often research efforts produce a marketable object. A good example is medicine developed as part of a research project. Obviously, the product produced is marketable if it is effective. Figure 13 indicate the support infrastructures involved in the development of a commercial product.
Producing a commercial product involves a new component, namely patent registration. Patent registration often leads to unnecessary complexities, which causes involvement with legal departments. Often the university will sell the product to a third party because they do not have the infrastructure to support the marketing process. In Figure 14, I show the relationship between the product, role players and production cycle.

I subdivide the commercial products into seven different categories. A *hardware device* includes items such as robots, computers and alarms. *Software* refer to games, educational products, financial packages or even a new programming object. Examples of a *model* are a systems model or a model for physical devices. Under the *prototype* category falls any design sold as a product, e.g., constructing a prototype of a building or a bridge and selling the design afterwards. The institution produces a number of *printed, visual and audio materials* and markets them as commercial products. Examples include books, tapes or videos on related topics.

In table 6 I indicate the relationship between the role players and the production cycle by means of a cross-reference table.
### 2.3.6 Internal Report

An internal report is a product, produced by University role players, which study University related issues and write a report based on the findings. The report is usually for internal usage only, but distribution of results or findings to external parties are possible. The infrastructures involved in the production of the internal report, include the staff support, staff systems, and environmental support systems (Figure 15).

![Figure 15: Infrastructures involved in construction of an internal report](image)

Within the development and distribution cycle of the internal report, the activities may differ from the proposed structure depending on the nature of the report (Figure 14). For example, the yearly reports do not have a new proposal each year. Should it be necessary to implement changes, the cycle enters the development cycle at the planning node. The target field refer to in Figure 16 is the related field included in the study.

The target group indicated in the role player component include all the people involved during the investigation for relative information for the report. For example, in composing a report such as the year report the target group consist of academic staff and administrative staff.
The production cycle starts with the new proposal followed by planning, investigation, report writing, production and distribution of the report. As mentioned previously, steps within each activity can differ depending on the kind of report written. In table 6, a cross-reference table indicate the relationship between the different role players and the production cycle.

<table>
<thead>
<tr>
<th>Role players</th>
<th>Production cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task group</td>
<td>New Proposal</td>
</tr>
<tr>
<td>Library</td>
<td>Planning</td>
</tr>
<tr>
<td>Target group</td>
<td>Research</td>
</tr>
<tr>
<td>Production staff</td>
<td>target field</td>
</tr>
<tr>
<td></td>
<td>Write report</td>
</tr>
<tr>
<td></td>
<td>Production</td>
</tr>
<tr>
<td></td>
<td>Distribute report</td>
</tr>
</tbody>
</table>

Table 6: Relationship between role players and report production cycle

From the cross-reference table one can clearly see the importance of the task group throughout the production cycle. The library can be included in the information gathering process or as reference when writing the final report.

### 2.4 Conclusion

Universities usually do not look at themselves from the production viewpoint, mainly because they do not realize that they are busy with a production process. In modelling university processes one can use different views, a financial view, system view, instruction view etc. In this chapter, I defined the DEU using a product view. In this chapter, I defined the different components and the relationships based on the HEI-model [1]. I also used cross-reference tables to indicate important relationships.
## Appendix A: Examples of infrastructures

<table>
<thead>
<tr>
<th>Support services</th>
<th>Systems</th>
<th>Environment Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff support and services</td>
<td>Staff Systems</td>
<td>Assignment services</td>
</tr>
<tr>
<td>Student support and services</td>
<td>Student Systems</td>
<td>Academic services</td>
</tr>
<tr>
<td>• Building administration services</td>
<td>• Accounting systems</td>
<td>Despatch services</td>
</tr>
<tr>
<td>• Market research services</td>
<td>• Internal relation systems</td>
<td>Examination services</td>
</tr>
<tr>
<td>• University teaching services</td>
<td>• Internal web systems</td>
<td>Library services</td>
</tr>
<tr>
<td>• Management information services</td>
<td>• Personnel systems</td>
<td>Telecommunication services</td>
</tr>
<tr>
<td>• Corporative communication and marketing services</td>
<td></td>
<td>• Assignment services</td>
</tr>
<tr>
<td>• Organisation development services</td>
<td>• Student systems</td>
<td>• Telecommunication support</td>
</tr>
<tr>
<td>• Publication services</td>
<td>• Registration systems</td>
<td>• Academic services</td>
</tr>
<tr>
<td>• Editorial services</td>
<td>• Web systems</td>
<td>• Despatch services</td>
</tr>
<tr>
<td>• Financial services</td>
<td></td>
<td>• Examination services</td>
</tr>
<tr>
<td>• Bursary services</td>
<td></td>
<td>• Library services</td>
</tr>
<tr>
<td>• Legal aid clinic</td>
<td></td>
<td>• Telecommunication services</td>
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<tr>
<td>• Research visit services</td>
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<td></td>
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<tr>
<td>• Scheduling</td>
<td></td>
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<tr>
<td>• Typing pool services</td>
<td></td>
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<tr>
<td>• Copying services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Counselling services</td>
<td>• Student systems</td>
<td></td>
</tr>
<tr>
<td>• Student support</td>
<td>• Registration systems</td>
<td></td>
</tr>
<tr>
<td>• Student bursary systems</td>
<td>• Web systems</td>
<td></td>
</tr>
<tr>
<td>• Legal aid clinic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Enquiry/information services</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Activities within each structure

- Building administration services
- Market research services
- University teaching services
- Management information services
- Corporative communication and marketing services
- Organisation development services
- Publication services
- Editorial services
- Financial services
- Bursary services
- Legal aid clinic
- Research visit services
- Scheduling
- Typing pool services
- Copying services
- Counselling services
- Student support
- Student bursary systems
- Legal aid clinic
- Enquiry/information services
- Accounting systems
- Internal relation systems
- Internal web systems
- Personnel systems
- Student systems
- Registration systems
- Web systems
- Assignment services
- Telecommunication support
- Academic services
- Despatch services
- Examination services
- Library services
- Telecommunication services
- Postal services
Appendix B: Examples of role players

Lecturing Staff:
- lecturers
- markers
- assistant
- Educational technologists

Students

Admin and Support staff
- Production staff
- Despatch staff
  - Postal system staff
- Assignments & Examination staff
- Library staff
- Registration staff
- Building admin
- Computer services staff
- Financial staff
- Telecommunication staff
- Information Centrum staff
- Bureau staff
- Student support staff
  - Post-grad student affairs
  - Undergrad student affairs
  - Matriculation board
  - Legal aid clinic
  - Bureau for student counselling
  - Bureau

Management
- Management teams
- Rector
- Vice-rector
- Registrar
- Boards
- Council

Other
- Researchers
- Programmers
- Task groups and Target groups within production of the Internal report
- Quality Assurance team
- Marketing team (could include lecturing staff & marketing staff)
- Advertising team
- Consultants
- Government
Bibliography