

THE ROLE OF INVENTORY CONTROL IN THE SERVICE QUALITY OF AN ACADEMIC LIBRARY IN REGARD TO LIBRARY MATERIAL ACCESS

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ABSTRACT

This article examines the possible impact of inventory control on the service quality of the academic library, using the academic library of the University of South Africa as an illustrative case study. Service quality components with a close relation to inventory control were identified. The first component identified was the library catalogue as a finding aid to provide relevant and accurate information to assist a client in discovering what information resources are located within the library. Two performance measures were chosen, namely client complaining behaviour (CB) in regard to the perceived state of the library catalogue before and after inventory control and the number of changes to the library catalogue after inventory control, indicating the number of incorrect item records on the catalogue. The second component identified was the ability of a client to find a specific information resource personally in the library when needed. This component was measured by availability study outcomes performed in the library, the number of misplaced information resources corrected during the inventory control project, and client complaining behaviour concerning the order of information resources on the shelves before and after inventory control. Overall, from the findings of the case study it can be concluded that the service quality of the library has improved as a result of inventory control.

1. INTRODUCTION

A basic assumption of the study is that the success of any organisation depends on its ability to provide and maintain satisfactory (tangible) commodities and/or services (actions or transactions) that answer the needs of clients. Moreover, a reputation for high quality products and services is why certain organisations are considered industry leaders.

Quality, which is synonymous with effectiveness and excellence, is a relative concept that depends significantly on client satisfaction with an organisation's products or services. The quality of products and services is therefore of paramount importance to draw and retain clientele. However, there is disagreement about the exact nature of quality because it depends on circumstances. Quality is measurable as the excellence of a product or service; client satisfaction with a product or service, and conformity of a product or service with a given requirement (Glossary of highway quality terms 1996, 14).

Universities, as higher education institutions, are actively engaged in a global striving towards excellence. A new culture of measurement and assessment of services is a response to the increasing competition facing higher education institutions in a swiftly changing, information-flooded context. Like institutions of higher education, academic libraries are under increasing pressure to conform to global standards of excellence. Abbott (as cited by Webb 1995, 2) writes that clients are becoming increasingly discerning and critical and expect the same high quality and efficiency as they do from commercial enterprises, with the result that in the 1990s accountability to clients and governments that provide funding increased sharply.

The belief exists that academic library functions and processes should be designed with a view to optimising service delivery and client satisfaction. Nitecki (1997, 2) argues that 'service quality contributes to value experienced' by clients, and that 'value becomes an outcome of excellent service'.

Service quality in an academic library is defined by clients' expectations, and also by their perceptions of the actual service they receive (Dalton 1991, 9; Hemon as cited in Vergueiro and De Carvalho 2000, 2). In other words, it refers to the client's judgement about 'value for money' received from the academic library. In some cases there is a perceived congruence between what clients expect and what they encounter (Edwards and Browne 1995, 163). A study conducted by Banwet and Datta (2002, 545) also found that 'an enhancement in the quality of service led to the users' satisfaction, which in turn led to positive post-visit intentions'.

Service quality in an academic library includes the following:

- the availability of qualified and experienced library staff that can identify

appropriate and sufficient information resources on a given subject when needed

- relevant collections (including online services), reflected in an up-to-date online catalogue
- the easy retrieval of the requisite information
- an appropriate and/or client-preferred manner in which information can be delivered, for example by e-mail
- the timeliness of a service in the sense of delivery when promised
- the excellence of electronic service (e.g., quick and easy access, client-friendly Website, customisation, security/privacy, site aesthetics, reliability and responsiveness) (Kyrillidou and Hipps 2001, 4).

Quality based on commercial considerations and the development of appropriate quality assurance tools became the subject of major research efforts in the academic library and information service sector during the 1990s. Like all other functions and activities in an academic library, inventory control of information resources has to contribute to the welfare and success of the whole organisation, which means the focus is on quality services to clients.

Inventory control of information resources refers to the verification of the total library information resources stock held by a specific academic library. Numerous and extensive inventory control studies in regard to academic libraries have been published internationally over time to describe some, or all, of the following:

- inventory control methods
- inventory control processes
- problems relating to inventory control
- the statistical results of inventory control (e.g. the number of information resources not found)
- the cost of inventory control
- the human resources capacity required to implement inventory control
- the conclusions in regard to the advantages and disadvantages of inventory control.

No study in South Africa has ever been done to determine the degree of positive influence of inventory control, as a support function, on the service quality of an academic library (Nexus Database 2005). One of the following two quantifiable possibilities will result from such a study, namely that

- that there is a significant degree of positive influence, or
- that the degree of positive influence on the service quality of an academic library is not significant.

A negative outcome would be either a direct indication of the futility of inventory control in regard to service quality enhancement in an academic library, or an indication that the academic library's core business of providing access to information resources does not require improvement.

Against this background the core problem of this study can be stated as follows: to investigate the role of an inventory control project in service quality of an academic library in regard to library material access. For this study the concept 'library material' refers to a multiplicity of formats, for example books, periodicals, videos, etc. The concept does not include access to electronic information resources. The inventory control project was executed from March 2002 to February 2004.

2. RESEARCH METHOD

According to Babbie (2001, 91) social research is mostly done to explore and describe a specific topic or subject area. The exploratory and descriptive research methods used in this study do not establish cause and effect relationships under experimental conditions. This study explores the main concepts of service quality and inventory control, as well as the possible relationship between them.

As with any other library function, inventory control of information resources has a tried, tested and proven technical expertise which differentiates the practitioner of information resources inventory control from the other library professionals. Although different ways of determining information resource loss have been tried through the years, all these methods and techniques had the same basic objectives, namely to determine the actual number of items not found through misshelving; pinpoint the exact number of missing, mutilated and stolen items, and predict vulnerable information resources.

For this study the library of the University of South Africa (Unisa) – as an academic library with at least a five-year proven inventory control experience and abovementioned inventory control objectives – was chosen as a case study. Service quality components with a close relation to inventory control were then identified. The first component chosen was the library catalogue as a finding aid to provide relevant and accurate information to assist a client in discovering what information resources are located within the library. The second component was the ability of a client to retrieve a specific information resource personally in the library when needed.

In regard to the library catalogue two performance measures were chosen to investigate, namely:

1. client complaining behaviour in regard to the perceived state of the library catalogue, before and after inventory control
2. the number of changes to the library catalogue after inventory control indicating the number of incorrect item records on the catalogue.

The ability of a client to retrieve library material was measured by availability study outcomes performed in the library, the number of misplaced information resources corrected during the inventory control project, and client complaining behaviour concerning the order of information resources on the shelves before and after inventory control.

2.1 COMPLAINING BEHAVIOUR (CB) CONCERNING THE LIBRARY CATALOGUE AND SHELF ORDER

Research done into complaining behaviour (CB), also known as complaint behaviour or complaint responses, is closely linked to client satisfaction levels. There is a distinction between the overall service satisfaction level of a client and his/her particular encounter with service satisfaction. This explains why respondents can indicate different levels of satisfaction for the same service in a survey questionnaire. For example, the client may be satisfied with the literature list provided by the subject librarian, but dissatisfied with the difficulty experienced in retrieving a particular book. Hom (2000, 104) explains this phenomenon in Figure 1, noting that the overall service performance experienced by the client is the product of more than a single service encounter experience.

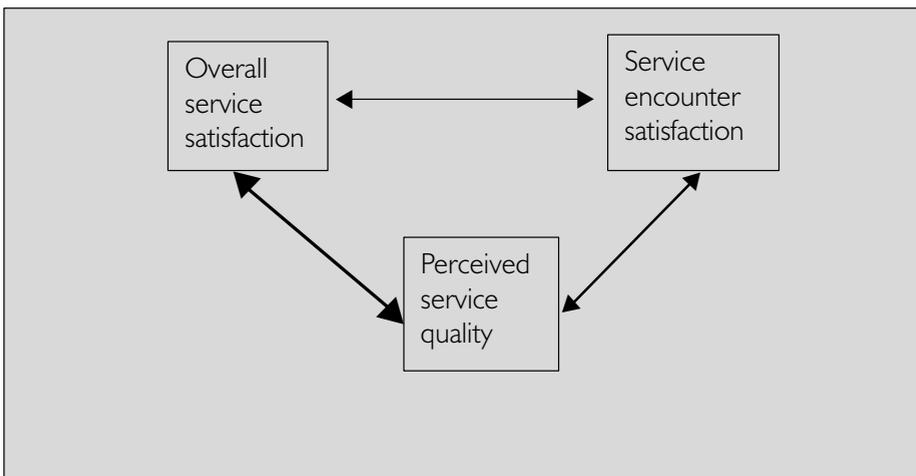


FIGURE 1: MODEL OF TWO LEVELS OF SATISFACTION AND PERCEIVED SERVICE QUALITY
 SOURCE: ADAPTED FROM HOM (2000, 104).

Every client observes the quality of services offered in different organisations and sectors and compares those service levels with some expected quality level or standard conceived by him/her. This quality level or standard differs from person to person. The comparison of actual service received and the client's 'standard' of service quality determines the degree to which the person is satisfied or dissatisfied with the service. The person then decides whether or not to complain about the service received.

A client's dissatisfaction is then expressed in complaints (CB), motivated by different factors such as technical service quality and staff behaviour (see Figure 2).

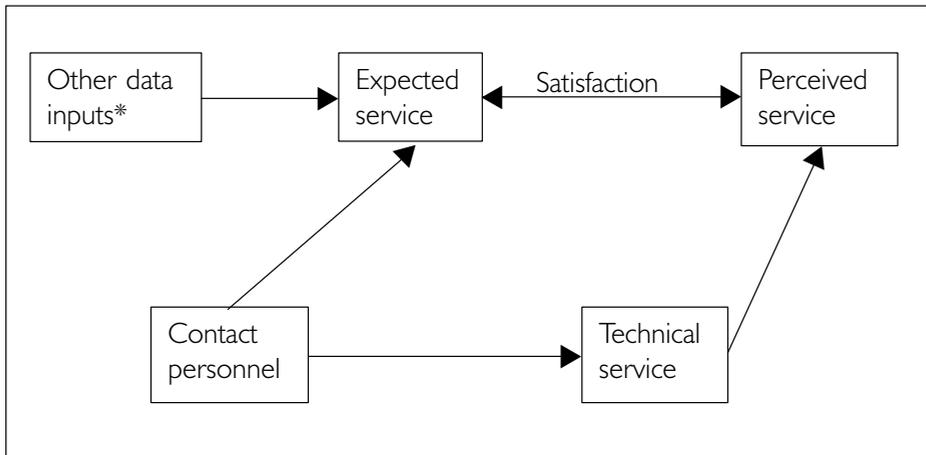


FIGURE 2: MODEL OF SOURCES OF CLIENT SATISFACTION
SOURCE: ADAPTED FROM HOM (2000, 104).

* Other data inputs, such as a noisy library or a power failure.

There are marked differences between people's threshold levels for expressing themselves through complaints. A large part of the population will never complain, while some can be described as habitual complainers. An unhappy client might not complain if he/she believed that a complaint would be ineffective (i.e., if the client's expectations for the outcome were low) or that its negative consequences would be too severe (Devereux and Weisbrod 2003, 3). 'Complaining behaviour therefore is not representative for the annoyance experienced by the total population' (Köster, Van Hoesel and Kolen 1984, 4). Although CB is a poor indicator of the general satisfaction level of a whole population in regard to a specific aspect of business, it is still a good indicator of how clients perceive the quality of a service offered at a given moment (De Meester and Mahieu 2005, 1). De Meester and Mahieu (2005, 1) describe

complaints as ‘critical incidents that define the client’s trust in or relationship with the organisation and which help correct the organisation’s struggle to offer quality service’.

Oh (2003, 43) states that existing CB models in the business world are not always directly applicable in academic libraries. He suggests that CB is divided into the following categories when applied to the library and information sector:

- ‘exit’ complaints in the sense of a vow or intention never to visit the particular library again
- ‘negative-word-of-mouth’ complaints in the sense that clients inform others about their dissatisfaction with the library and/or the service
- ‘voice’ complaints in the sense that clients complain directly to a library staff member or through written complaints
- ‘third party complaints’ in the sense that clients complain to the organisation but not directly to the library itself.

In this study the number of written complaints as examples of ‘voice’ complaints about the perceived state of the library catalogue and the order of the shelves before, during and after inventory control were considered.

Research done during Coca-Cola’s 1980s change from Coke to New Coke showed that one dissatisfied client in 50 made the effort to complain (Leluc 1999, 1). In a five-day survey in the Unisa Library during a peak time in 2002, with an average of 1 400 students visiting the Unisa Library per day, it was found that 19 students were unhappy about the library catalogue for every one written complaint in this regard, while 23 students were negative about the disorder of the shelves for every one written complaint.

2.2 THE LIBRARY CATALOGUE AS A FINDING AID

It will be almost impossible for a client to know where to locate an information resource or specific subject on the shelf in an academic library without the help of a library catalogue. The library catalogue contains, *inter alia*, bibliographic records (metadata) of the physical collections housed in the library. The quality of the metadata will affect the ability of an academic library to deliver quality services. Poor quality of metadata refers to incomplete, inconsistent or inaccurate bibliographic records (Matthews 2000, 2).

The number of corrections made to bibliographic records will give an indication of the quality of the catalogue. For this study the different kinds of changes that were made as a direct result of inventory control were calculated.

2.3 AVAILABILITY STUDIES

Availability ‘deals with the balance of supply and demand of library material. It is defined as the proportion of the material requested by the user that can be used in the library (including copying) or taken home immediately’ (Poll and Te Boekhorst 1996, 84). The purpose of this performance measurement is to establish to what extent the library can satisfy a client’s immediate information need. In other words, can the client promptly find the information resource(s) for which he/she is looking?

Kantor’s (1976a and 1976b) research into availability and its measurement is the basis of many availability studies performed by academic libraries. Any academic library client needs to overcome four barriers successfully to locate an information resource:

- an acquisition barrier (is the information resource part of the academic library’s collections?)
- a circulation barrier (is the information resource available for use?)
- a library barrier (is the information resource, with a clear call number, correctly shelved in the proper collection?)
- a client barrier (can the client locate the information resource on the shelf?)

The Unisa Library’s availability studies are based on Kantor’s (1976a) availability performance measurement design used at Case Western Reserve University, but differ in two aspects, namely that the measurement includes all kinds of information resources, regardless of medium, and that the components of the barriers are tailored to the Unisa Library’s set-up (see Table 1).

The steps in calculating the overall probability that a client locates an information resource sought are as follows:

Step 1: Determine the total number of items indicated on the questionnaire, e.g. 493 items.

Step 2: Subtract the number of items invalid (such as incorrect or insufficient information to identify the information resource), e.g. 11 items.

Step 3: Determine the total number of items surveyed (W), e.g.:

W = clients were looking for 482 items (in other words, the sample size).

Step 4: Determine the total number of items found by the clients (S): e.g.:

$$\sum_{i=1}^n x_i \text{ where } i = \text{a client's response in regard to the number of items found,}$$

e.g.

S = 285 items found.

TABLE 1 **KANTOR'S BARRIERS AND THEIR COMPONENTS TAILORED TO THE UNISA LIBRARY SETUP**

Barriers to overcome	Symbol	Description
1. Items not part of the library collection Acquisition barrier = DA $DA = A_1 + A_2 + A_3$, e.g. $DA = 61 + 4 + 1 = 66$	A ₁	Items not owned on this site and also not on order, e.g., 61 items.
	A ₂	Items on order, but not yet part of collection, e.g., 4 items.
	A ₃	Items withdrawn at this site, e.g., 1 item.
2. Items in stock, but used by client(s). Circulation barrier = DC $DC = C_1 + C_2 + C_3$, e.g. $DC = 74 + 3 + 1 = 78$	C ₁	Item taken out by a client (ILL included), e.g., 74 items.
	C ₂	Item on hold shelf, e.g., 3 items.
	C ₃	Item used by a client in the library such as a video watched, e.g., 1 item.
3. Items in stock and not circulating, but not in correct location due to library error. Library barrier = DL $DL = L_1 + L_2 + L_3 + L_4 + L_5$, e.g. $DL = 1 + 1 + 2 + 1 + 7 = 12$	L ₁	Item location and its library catalogue location differ, e.g., 1 item.
	L ₂	Item in process, excluding ordered items, e.g. 1 item.
	L ₃	Item in pre-shelving, e.g., 2 items.
	L ₄	Item in bindery, e.g., 1 item.
	L ₅	Item not found on shelf, e.g., 7 items.
4. Items not found due to client error. Client barrier = DU $DU = U$, e.g. $DU = 41$	U	Item correctly catalogued and properly shelved not found by client, e.g., 41 items.

Step 5: Determine the total number of items not found by the clients:, e.g.:

$$\sum_{i=1}^n x_i, \text{ where } i = \text{a client's response in regard to the number of items not found, e.g.}$$

items not found = 197 items (the barriers represented by these 197 items are indicated in Table 5.3).

Step 6: Calculate the probability of acquisition (P_A) as $V \div W$ to the fourth decimal, where $W = V + DA$, e.g.:

$$V = W - DA = 482 - 66 = 416 \text{ and} \\ P_A = V \div W = 416 \div 482 = 0,8631 \text{ (86\%).}$$

Step 7: Calculate the probability that an owned item is not circulating (P_C) as $U \div V$ to the fourth decimal, where $V = U + DC$, e.g.:

$$U = V - DC = 416 - 78 = 338 \text{ and} \\ P_C = U \div V = 338 \div 416 = 0,8125 \text{ (81\%).}$$

Step 8: Calculate the probability that an owned item is not circulating and is correctly shelved (P_L) as $T \div U$ to the fourth decimal, where $U = T + DL$, e.g.:

$$T = U - DL = 338 - 12 = 326 \text{ and} \\ P_L = T \div U = 326 \div 338 = 0,9645 \text{ (96\%).}$$

Step 9: Calculate the probability that a client has correctly located the owned item on the shelf (P_U) as $S \div T$ to the fourth decimal, where $T = S + DU$, e.g.:

$$S = T - DU = 326 - 41 = 285 \text{ and} \\ P_U = S \div T = 285 \div 326 = 0,8742 \text{ (87\%).}$$

Step 10: Calculate P_S as $P_A P_C P_L P_U$, e.g.:

$$P_S = 0,8631 \times 0,8125 \times 0,9645 \times 0,8742 = 0,5913 \text{ (59\%).}$$

In other words, there is a 59% probability that a client can locate an information resource on the shelf.

Step 11: Determine the availability study mean success rate percentage for a specific year. In other words, calculate the mean for the four availability studies in one year by using the following statistical formula:

$$\bar{x} = (1 \div n) \sum_{i=1}^N x_i$$

For example:

First quarter:	x = 56	n = 391
Second quarter:	x = 24	n = 420
Third quarter:	x = 37	n = 438
Fourth quarter:	x = 29	n = 346

$\therefore \sum x_i = 146$ items not found.

$\therefore N = 1\,595$ items searched for by clients.

$$\begin{aligned}\bar{x} &= (1 \div 1\,595)(146) \\ &= 0,0915\end{aligned}$$

The success rate percentage is $100 \times \bar{x} = 9,15\%$

$100\% - \bar{x} = 90,85\%$ success rate for the year.

Step 12: Determine the accuracy level (h) of the sample on a 95% confidence level ($Z\alpha = 1,960$) by using the following statistical formula:

$$h = Z\alpha \sqrt{p(1-p)} \cdot \sqrt{\frac{1}{n} - \frac{1}{N}}$$

where n = sample size (number of information resources needed)

N = total collection size

p = calculated proportion ($n \div N$).

The availability surveys also include questions on the satisfaction level of clients with their visit on that specific day.

For this study the general availability studies conducted in the Unisa Library on the main campus in Pretoria were considered. These studies include only clients who personally visit the library.

2.4 SHELF ORDER

Cooper and Wolthausen (1977, 43) state: ‘If books are out of order on the shelves of the library, the likelihood that a user will find a desired book is reduced.’ Shelf reading (i.e. checking whether an information resource is in its proper position on the shelf according to its call number) and shelving (i.e. positioning an item back on the shelf in its correct place on the shelf after it was used by a client) are serious concerns, because an incorrectly placed item on the shelf is a lost item (Owens 1992, 14).

For this study the number of items inventory controllers found not in their

proper place on the shelf, according to its call number while doing stocktaking, was calculated.

3. BACKGROUND INFORMATION

Unisa celebrated its 130th anniversary in 2003, which makes it the oldest university in South Africa. Unisa merged with Technikon South Africa and the distance education section of Vista University, called Vudec, in 2004. The new Unisa has just over 200 000 students scattered all over the world.

3.1 THE UNISA LIBRARY

The Unisa Library provides all library and information services required to support the above-mentioned academic structures. In 1946 the first book of the Unisa Library was accessioned and in 1996 the Unisa Library celebrated 50 years of service. The Unisa Library employs 272 staff members and houses 2 million publications, 600 electronic books (e.g. *Oxford English dictionary*), 8 000 current journal titles (paper based), 23 000 electronic journal titles, 15 000 electronic course reserves, 220 bibliographic and full-text databases, 213 000 microfilms and microfiches, 46 000 art slides, extensive Southern African archival materials and 35 000 audio visual resources.

The publications are found in open-stack arrangement in all the Unisa branch libraries, as well as in some public libraries around the country. Excluding the latter, all these collections are subjected to inventory control.

3.2 RISK FACTORS IN THE UNISA LIBRARY

Access to the Unisa Library is controlled with security staff at access points, as well as an electronic security system. If the risk factors identified by Lincoln and Lincoln (1986, 12–17) are considered in the context of the Unisa Library it seems logical to conclude that rather than easy access, the real problem lies with the desirability (i.e. temptation to gain illegal possession) of certain information resources. For example, textbooks become high-risk items when they are prescribed, and some stolen Unisa Library books even find their way to informal booksellers on the street. It is very difficult to control this phenomenon.

Unisa Library's open stacks spread out over eight levels and sparsely distributed visitors during operating hours after 16:00 and over weekends provide a good opportunity for certain criminal acts, such as removing a tattle-tape strip from a book, because clients are largely hidden from the sight of library and security staff among the open-stack collections. On the other hand, the high volume of visitors during peak hours presents a similar

surveillance problem. Unisa Library's risk exposure is heightened by the lack of training in security techniques of all its library staff. Unisa follows strict policies to discourage illegal removal of information resources, such as suspension of enrolment if an apprehended perpetrator is a Unisa student.

3.3 INVENTORY CONTROL

By 1992 the number of items that were suspected of falling prey to illegal removal from the research and reference stock of the library had grown to alarming proportions. The reasons for awareness of the problem were:

- the increase over years in complaints received from Unisa Library clients and staff that they found it difficult to retrieve information resources in the library;
- the increase in the number of missing items indicated on the library computer system catalogue called OASIS.

The situation caused grave concern because of its negative implications for the record of service excellence that the library was trying to establish and maintain. The Library Management Committee and Unisa's internal auditors therefore ordered an inquiry to determine the dimensions of the problem.

Surveys were conducted until 1998 when the annual stock survey revealed disturbing trends regarding probable stock losses in the audiovisual section, particularly in the Compact Disc collection. A complete inventory was therefore taken of this specific collection in 1999. In the same year an increase in missing items was revealed in the research collection. The Unisa Department of Internal Audit then called for a full inventory control of the reference collection and part of the research collections, which was approved by the management committee of the Unisa Library.

A complete stocktaking of the research collection, reference collection, study collection (prescribed and recommended books) and the science library was scheduled for March 2002 to February 2004.

Randall (1972, 130) warned that inventory control must only be considered after 'careful planning in which the library staff participates and after the users have been advised of the necessity of the activity and the procedures to be followed'. The initiation of the inventory control project in the Unisa Library did not follow this route for the following reasons:

- Involvement in inventory control was confined to the Library Management Research Section of the Unisa Library. Additional staff requirements are met by employing student workers who receive in-service training. These student workers can keep their positions for 12 months.

- Inventory control did not involve the physical closure of the library and/or the interruption of services to clients.

Inventory control is usually a complex and a time-consuming task in academic libraries (Gupta 1990, 16), and the Unisa Library was no exception, for the following reasons:

- Physical control and checking of inventory lists against the information resources on the shelves are difficult, because the inventory is conducted in different locations.
- The diversity of the items in the inventory presents difficulties. The inventory in the Unisa Library includes books, periodicals, microfiche, videos, and compact data discs.
- Inventory control is done while the organisation is operational. A book can be borrowed, returned, renewed or removed from its location for other purposes (e.g. browsing by library clients) at any time.
- The valuation of inventory is also difficult due to the size of the library's collections (more than 2 million items).
- Call number or location mistakes can cause havoc during inventory control.
- Non-availability of permanent staff members to take on the extra workload was a major issue during the initial phase of the inventory control project.
- Browsing clients may move library resources from one shelf to another or items may be moved for operational reasons, for example when a damaged book is sent to the bindery.
- Cataloguing discrepancies and other technical errors are major obstacles in locating certain items.
- Automated stocktaking is still not possible because the number of digits per barcode is not standardised. Items in the Unisa Library have 10-digit and 6-digit barcodes, while a significant number of information resources still need to be fitted with barcodes.

4. RESEARCH RESULTS

4.1 COMPLAINING BEHAVIOUR (CB) CONCERNING THE LIBRARY CATALOGUE (OASIS)

Specific complaints about an aspect of the Unisa Library services, such as OASIS, are usually listed. Three types of written complaints about OASIS were identified: complaints that OASIS is slow; that the number of computers available to access the catalogue is insufficient, and that information resources that should be available for use according to OASIS cannot be found on the shelf by clients and library staff alike. The frequency of the last complaint has declined as inventory control progressed from 2002 to 2004 (see Table 2).

TABLE 2 _____
COMPLAINTS REGARDING THE UNISA LIBRARY CATALOGUE (OASIS)

Year	According to OASIS, items are available but cannot be found on the shelf	Number of clients represented [1 written complaint = 19 clients not complaining]
2001	14	266
2002	15	285
2003	5	95
2004	2	38

Overall it seems as if inventory control, with its component of shelf reading as a first step in the process, has caused an improvement in clients' perception of how accurately OASIS reflects the availability of items on the shelf.

4.2 NUMBER OF CHANGES TO OASIS

During the inventory control project the inventory control team kept a record of the number and type of changes made to OASIS as a direct result of inventory control. The different kinds and respective numbers of changes are shown in Table 3.

TABLE 3 _____
OASIS CHANGES FROM MARCH 2002 TO FEBRUARY 2004

Type of problem corrected on OASIS	Number of problems
Call number incorrect on item or on OASIS	2 564
Location of item incorrect on OASIS	299
Status of item incorrect on OASIS (e.g. according to OASIS item is on shelf, but item is in the bindery)	1 115
Items in collection, but not reflected on OASIS	4 592
Items with no accession number	15
Items in original accession records, but not on OASIS	1 137
Items marked missing on OASIS	17 480
TOTAL	27 202

SOURCE: RETIEF (2004).

The number of changes made on OASIS, namely 27 202, played an important role in ensuring an up-to-date library catalogue for the reference and research collections in the Unisa Library. These actions help restore the integrity of the library catalogue.

4.1 AVAILABILITY STUDIES

In the Unisa Library one day is set aside on a quarterly basis for a general availability survey. A library staff member asks every client leaving the academic library for how many items he or she was looking. The staff member will also ask the client to list the information resources they searched for and could not find. It does not matter whether a client came to the academic library with a specific item in mind or identified items during a search of the library's catalogue and indexes.

The items that were not found by clients are followed-up by library staff to determine the reason for the clients' failure in retrieving the needed information resource. The reasons for non-availability show some consistency over the years and can be categorised as follows:

- Failure to find the item on the shelf due to the fact that:
 - the item is already issued
 - the item is on interlibrary loan
 - the item is in the cataloguing process
 - the item is on order but not yet received by the library
 - the item is in transit between Unisa branch libraries
 - the item has been withdrawn from the library stock
 - the item is missing, or
 - the item is available but not found on the shelf.
- Failure to find the item on OASIS due to the fact that:
 - the item is not part of the library stock.
- Clients have insufficient or incorrect information regarding the information resource needed.

The Unisa Library has conducted availability studies since 1986. The results of all general availability studies from 2001 to 2004 are indicated in Table 4.

As the inventory control project of the research and reference collections was conducted from March 2002 to February 2004, the means of the total sample sizes of 2001 (the availability study before the inventory control project was implemented), 2002 and 2003 (the availability studies during inventory control), and that of 2004 (the availability study after the inventory control project was completed) were compared.

TABLE 4 _____
**RESULTS OF THE UNISA LIBRARY GENERAL AVAILABILITY STUDIES,
 2001 TO 2004**

Year	Q 1 (%)	Q 2 (%)	Q 3 (%)	Q 4 (%)	Total sample size	Satisfaction rate (%)
2001	90.9	79	88.9	93.6	434	88.2
2002	87.3	94	83.4	97.4	342	89.0
2003	88.1	93.4	86.1	88.7	326	89.8
2004	83.9	81.9	91.9	95.7	1 056	88.1

Q = Quarterly measured satisfaction level expressed in percentage

The conclusion is that there seems to be no significant difference in the end results of the individual availability study's outcomes.

4.2 SHELF ORDER

During the first year of the inventory control project of the research and reference collections of the Unisa Library in Pretoria (2002), the inventory controllers found that the disorderly shelves created major problems for finding the needed information resource. During the inventory control project of March 2002 to February 2004, 10 781 items were re-shelved in their correct order on the shelf as a direct result of inventory control (Retief 2004, 63). In September 2003 student workers were appointed to help with shelf reading.

Complaints about disorderly shelves expressed in written format are shown in Table 5 and cover the period 2001 to 2004.

TABLE 5 _____
**WRITTEN COMPLAINTS ABOUT THE DISORDERLY STATE OF THE SHELVES FROM
 2001 TO 2004**

Year	2001	2002	2003	2004
Number of complaints	28	13	8	5
Number of clients represented [1 written complaint = 23 clients not complaining]	644	299	184	115

The shelf reading project did result in tidier, more orderly collections. It

improved availability of items and clients found it easier to retrieve desired items. The CB decreased in regard to the state of the shelves since 2002.

Shelf order was a major complaint in the Unisa Library before inventory control started. Inventory control of a specific collection is always preceded by shelf reading. Although client complaints did decrease, it is not really possible to conclude that inventory control alone was the cause. It is rather a combination of shelf reading and inventory control, but their influence is not divisible into exactly proportioned separate components from the available data.

5. BENEFITS OF INVENTORY CONTROL

The benefits of inventory control touch different aspects in the Unisa Library, namely benefits for collection management, security, clients and library staff.

5.1 THE BENEFITS FOR COLLECTION MANAGEMENT

- Misplaced, misshelved and missing information resources are recovered.
- Items in need of maintenance are identified, such as items in need of re-binding.
- Mutilated information resources can be located.
- Missing items that are still considered as essential are identified for procurement.
- Inventory control adds regular dusting of the information resources.
- Incorrect call numbers can be corrected and missing call numbers from items can be replaced.
- Overcrowded shelves can be rectified by coordinated shifting efforts of information resources.
- Inventory controllers detect books that have been pushed back behind others or have fallen between shelves.
- Books are evenly aligned for an orderly appearance of the shelves. The library catalogue can be updated to reflect the holdings of the academic library.
- Inventory control improves library services, such as retrieving of items when needed.
- Unprocessed items in the collections can be identified.
- Items returned by clients but library catalogue indicated differently, can be retrieved.
- The results of inventory control support space planning by providing correct collection sizes.
- Inventory control provides concrete information for the library management

to make operational and financial decisions regarding collection management.

5.2 SECURITY BENEFITS

- Trends in information resource loss can be identified.
- Vulnerable items in need of special protection are identified, which will help minimise library loss.
- The estimated cost of missing items can be established.

5.3 BENEFITS INVENTORY CONTROL HOLDS FOR CLIENTS

- Clients can access an up-to-date library catalogue.
- Fewer items are indicated as missing on OASIS.
- When OASIS indicates that an information resource is available, it is usually in its proper place on the shelf. In other words, inventory control enhances the accuracy level of OASIS.
- Shelves are neat and in order.
- It is easier to retrieve a desired information resource from the shelves.
- Less frustration is experienced by clients attempting to retrieve an item.
- Inventory control helps improve client satisfaction.

5.4 BENEFITS TO STAFF

- Inventory control improves the efficiency of staff when locating an information resource.
- Staff can render a professional service and ensure client satisfaction.
- Inventory control can help improve pride in their library and the service they render.

6. LIMITATIONS OF THE STUDY

The findings of this study may be limited to academic libraries in similar settings. Service quality determinants selected for this study were measured as the aggregate of their attribute components. In this context all attributes were given equal weight in the components. This approach obscures the possibility that any single performance indicator (e.g. CB) may be a more important determinant of service quality when compared to the rest of the chosen indicators (e.g. the availability of an item).

The influence of various situational variables on the investigation was not determined in this study. At least three major situational variables were not considered:

1. library conditions at the precise moment of the performance measurement, such as poor lighting in a specific area when a client is looking for a specific item on the shelf, with the result that the client fails to retrieve the item;
2. library client behaviour while inventory control is in full swing (e.g. the browsing client removes a specific information resource from its proper position on the shelf after shelf reading has been done, but before inventory control can reach it);
3. re-cataloguing of information resources in a particular discipline while inventory control is done in that collection.

8. CONCLUSION

The mandate of this study was to investigate the contribution of inventory control to service quality in an academic library. As already noted, an extensive list of benefits was derived from the inventory control project. Clients' perception of how accurately OASIS reflects the availability of items on the shelf improved, while complaining behaviour in regard to the disorder of information resources on the shelves decreased. Over 27 000 bibliographic records were corrected on the library catalogue. Overall, the conclusion can be drawn from the findings of the case study that the service quality of the Unisa Library has improved as a result of inventory control.

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