DEVELOPMENT OF A BUSINESS TOOL TO EVALUATE THE NORTHERN HEALTH CONNECTIONS PROGRAM

by

Karen Nagra-Atwal

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ABSTRACT

Organization and program self-assessments are important tools for enabling companies to learn and improve. Much like an annual health physical, they help managers better understand both what is working well and what areas require attention. Self-assessments also are effective for communicating priorities to various stakeholders and for monitoring progress over time, and their greatest value is their ability to enable organizations to improve their performance and produce positive results.

Self-assessment tools are well-evaluated in the literature, and Northern Health – as an organization striving for excellence – can make good use of them to meet the needs of its “Northern Health Connections” patient-transportation program. Ideally, tools would already exist that can be easily modified to suit the program’s needs; however, because Northern Health Connections is a unique, multi-faceted program, it needs a new tool developed using existing self-assessment frameworks.

This project proposes a tool consisting of a Route Evaluation Flow Chart (REFC) and an accompanying Questionnaire. The tool will assist managers at Northern Health Connections in the essential task of allocating transportation resources for moving patients to and from northern British Columbia’s medical facilities. In this paper, I will present an overview of the relevant literature and then discuss the tool’s conceptualization, design, and development. Finally, I will recommend that Northern Health Connections integrate the REFC tool into their daily operations.
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I admire and thank my Lord and my family - from the bottom of my heart - for all their unconditional love and support through my life’s journey.

I dedicate my Masters degree to my Dad (for being my very best friend and an angel who always believed in me, saying that nothing is impossible if you believe), my Mom (from whom I have always drawn my strength and learned to never give up), my brother Sodhi (to whom I am indebted with gratitude and appreciation for always being my pillar), and to my amazing children Yasmin, Naveen and Devan (for their inspiration and patience during for the past two years!)
INTRODUCTION

For years, Canadian healthcare organizations have endured an increasingly-turbulent environment. Rising costs, combined with falling federal and provincial-government funding, have forced them to merge, restructure, and make numerous other difficult changes. Governments are pressuring healthcare organizations to improve their efficiency and effectiveness, and private-sector competitors are now well-entrenched and growing rapidly (Chan, Y.L. and Lynn, B.E., 1993).

These pressures to improve performance have driven healthcare managers to search for tools by which they can receive feedback on their activities, measure their performance, ensure continuous improvement, manage the stages of transformation, and gauge their progress towards organizational goals (Chan, Y.L. and Lynn, B.E., 1993). Of the numerous such tools that have appeared over the past few years, perhaps none have been more pervasive or influential than the “quality revolution” (Dobyns and Crawford-Mason, 1991; Hunt, 1992).

Disciplines such as TQM (Total Quality Management) and CQI (Continuous Quality Improvement) - collectively referred to in this paper as TQ (Total Quality) - are compelling to theorists and practitioners alike because of their unique philosophies of management and their useful tools and techniques for improving operating performance and securing long-term customer satisfaction and loyalty (Gaucher and Coffey, 1993). Disagreement over implementation methods sometimes interferes with the effectiveness of corporate TQ initiatives; however, as a response to rapidly-escalating healthcare costs and as a means for fixing an increasingly unwieldy, insensitive, and unresponsive
healthcare system, TQ has been labeled both as a “prescription” (Hassen, 1993) and as a “cure” (Berwick et al., 1990).

In late 1992, almost half of the respondents in a survey of 1,300 Canadian healthcare institutions reported that they had adopted, or were considering adopting, a CQI philosophy (Baker et al., 1993). However, more recent evidence suggests that the rate of adoption and the degree of integration of such principles and methods has slowed and perhaps even begun to recede (Chan and Ho, 1997). Although most Canadian healthcare organizations have adopted many fundamental TQ principles, tools and techniques, too few use them to secure strategic excellence (Baker, 1994). According to Dale and Lightburn, 1992, having a formal TQ program does not equate to having an enduring commitment to CQI over the long haul. Without a steadfast commitment from top management, few performance enhancements are possible. Therefore it is important to convince organizational leaders of the value of a TQ program, and to provide them with the necessary tools.

The information outcomes provided by Northern Health’s self-assessment tools are essential for gauging the success of, and understanding how to improve, business processes and formal programs such as Northern Health Connections. Moreover, they can be directly incorporated into Northern Health’s business planning.

Self-assessments’ real value is their ability to enable performance enhancements that improve outcomes and bring tangible organizational benefits. This value is established in studies such as the following:
In a 2001 study, organizations that won their State Quality Award greatly outperformed a control group of matched companies:

- operating profit margins of 46.8% versus 2.7%
- ROA (Return on Assets) of 10.3% versus -5.5%
- ROE (Return on Equity) of 18.7% versus -5.9%

In a similar study in 1999, award winners showed much greater growth than similar organizations in a control group:

- 58% faster growth in stock price appreciation
- 114% faster growth in total assets
- 116% faster growth in sales
- 229% growth in employees

Overall, organizations using self-assessments showed high and improving levels in numerous indicators pertaining to operations, financial results, and a broad variety of stakeholders such as employees, suppliers, customers, patients, medical students, and the general public. Therefore, the purpose of this project is to develop a self-assessment tool for Northern Health.
ORGANIZATIONAL BACKGROUND

Northern Health (NH) is a BC Ministry of Health organization that delivers healthcare (acute care, mental health, public health, addictions, home & community care services, etc.) to the 310,000 people living in the northern two-thirds of the Province. Its service area (see Figure 1) ranges from the Northwest and Yukon Territories on the north to the BC Interior on the south, and from Alberta on the east to Alaska and the Pacific Ocean on the west (Ashley Stoppler, 2009).

Figure 1 - Map of Northern Health
NH’s client communities vary greatly in size, ranging from remote villages (such as Dease Lake and Atlin) with only a few hundred residents, to mid-sized cities (such as Prince George and Prince Rupert) with tens of thousands of people. The communities also vary greatly in their access to local healthcare: many villages have no services, whereas others have rural nursing outposts; a few towns have centres for diagnosis and treatment or tertiary referrals; the most populous towns have community hospitals. Specialized services, such as radiation oncology and neurosurgery, are not provided by NH, and having limited healthcare services spread over such a large, sparsely-populated area means that patients must often travel long distances for medical appointments in larger provincial centres such as Grand Prairie, Kamloops, and Vancouver (Ashley Stoppler, 2009).

PROGRAM OVERVIEW

Northern Health Connections is a bus travel service (begun in July of 2006) that safely, efficiently, and cost-effectively transports Northern BC residents to services not offered in their home communities. The service is contracted out to DTL (Diversified Transportation Ltd.) who provide ten wheelchair-accessible buses (five minibuses for short, same-day routes and five coaches for longer, multi-day trips) that are customized for patient comfort and run on a fixed weekly schedule. The buses pick up and drop off passengers at medical facilities along the routes (Ashley Stoppler, 2009).
LITERATURE REVIEW

Importance

A review of current TQ literature will familiarize the reader with various TQ objectives, approaches, applications, merits, and drawbacks. By consulting numerous sources, I have developed an understanding of the relevance of TQ to healthcare organizations in general and Northern Health in particular. My findings have led me to design a self-assessment tool for improving the effectiveness of Northern Health Connections. In following pages immediately following, I will present a brief history of TQ in North American healthcare and then describe and compare two common approaches to TQ evaluation: the “Quality Audit” and the “Self-Assessment”. This background information will assist the reader in understanding and appreciating the usefulness of my self-assessment tool, which I will present towards the end of this paper.

TQ in Healthcare

The appearance of TQ in North American healthcare was spearheaded by organizational leaders who – being strongly convinced of its potential to dramatically reconstruct healthcare delivery in a patient-focused, cost-effective way – vigorously championed its basic tenets and practices (Berwick et al., 1990; Hassen, 1993; Melum and Sinoris, 1992).

As a result North American quality standards – which are issued by the US Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and by the Canadian Council on Health Services Accreditation (CCHSA) – have made CQI mandatory for hospital business planning (Heidemann, 1993; O’Leary, 1991).
However, many of the organizations that later embraced TQ have had great difficulty with implementing and integrating CQI as a “way of life”. These “late adopters”, having neither adequately assimilated TQ principles nor fully inculcated its techniques, have stalled in the implementation of TQ (Motwani et al., 1996). Under pressure of reorganizing, downsizing and otherwise controlling costs, their preoccupation with reactive, short-term crisis-fighting (instead of proactive, long-term investment in CQI) has rendered them unable to focus on quality for more than brief periods.

Because many healthcare organizations (and their management) view TQ as an externally-imposed and complex process, they often banish TQ to the “quality department”, or even worse, they label it as a pernicious fad that should be “waited-out” (Darr, 1993; Spector and Beer, 1994). Unfortunately, too many want a TQ “quick-fix” without having to make the necessary investments in changing processes and educating people. As a result, many recent Canadian healthcare TQ initiatives have floundered.

**The International Standards Organization (ISO)**

The International Standards Organization (ISO) is a non-governmental organization, the world's largest developer and publisher of International Standards, and a bridge between the public and private sectors. Although often part of (or mandated by) their respective governments, many ISO members are private sector-organizations created by national partnerships of industry associations. ISO enables a consensus to be reached on solutions that meet both the specific needs of business and the broader needs of society by:

- making the development, manufacturing and supply of products and services more efficient, safe and clean
facilitating trade between countries and increasing fairness

- providing governments with a technical base for health, safety and environmental legislation and conformity assessment
- disseminating innovation, sharing technological advances, and spreading good management practices
- safeguarding consumers (and users in general) of products and services
- making life simpler by providing solutions to common problems

ISO standards are fundamental to the “quality audit” methodology described below.

**Quality Evaluation Methodologies**

“Improve or perish” is the attitude that businesses must adopt in order to compete in today’s rapidly-expanding global markets - and in order for them to be of any benefit, “improvements” must be clearly defined and subject to evaluation.

In recent years, two quality-focused performance evaluation methodologies have received significant attention in managerial circles: quality audits (QAs) and self-assessments (SAs). Their purposes are different, but complementary: on one hand, QAs (often employing “quality awards”) examine the compliance of quality systems with unambiguous ISO 9000 standards, and they then assess those systems’ suitability for achieving clearly-defined objectives. On the other hand, SAs measure organizational performance against BEM (Business Excellence Model) criteria, two examples of which are the European Quality Award (EQA) and the Malcolm Baldrige National Quality Award (MBNQA) (Karapetrovic and Willborn, 2006).

In a continuous improvement effort, an organization can effectively applying both evaluation methodologies, first by using an ISO 9000 quality system to lay out the
groundwork, and then by employing a business excellence model for ongoing
performance enhancement (Karapetrovic and Willborn, 2006)

**Quality Audits**

Cambridge University Press, 2000, defines an “audit” as “an official
examination”, and the ISO (International Standards Organization) further defines a
“quality audit” as “an independent and documented process for obtaining audit evidence,
and evaluating it objectively to determine the extent to which audit criteria are fulfilled”
(ISO 9000, 2000). In a quality audit, evaluations are performed by collecting “audit
evidence”, assessing its compliance with “audit criteria” (i.e. reference standards such as
those contained in ISO 9001) in order to arrive at “audit findings”.

Although many standards specify a single audit criteria (i.e. findings can only
indicate either full compliance or noncompliance), some can contain multiple criteria. In
these cases, an audit evaluates the extent to which audit criteria are fulfilled (ISO 9000,
2000) and its findings will range from 0 percent (i.e. no criteria met) to 100 percent (all
criteria met). Also, the number and composition of criteria used in an audit can be
affected by the leeway that business owners typically have in determining the
applicability of certain requirements to their businesses (Karapetrovic and Willborn,
2006).

Due to the somewhat rigid, “satisficing” nature of audit criteria (Uzumeri and
Tabor, 1997), audit methodologies are designed to be searches for evidence that are
independent, objective, and well-documented. Although these principles ensure
professionalism and accuracy, they typically mean that the search for improvement
opportunities is only performed by senior managers and external auditors (van der Wiele et al., 2000b). Additionally, the commonly-held view of audit results as overly simplistic judgments has caused many organizations to lack the motivation to incorporate identified improvement opportunities into their business plans.

**Self Assessments**

Self-assessments are used to underpin continuous improvement by measuring an organization’s current performance against a model that represents a “position of excellence” (Kaye and Anderson, 1999. Most of the literature (e.g. van der Wiele et al., 2000a; 2000b; 2000c; Caffyn, 1999; Hormann and Kern, 1999; Jackson, 1999; Kaye and Anderson, 1999; Pitt, 1999; Porter et al., 1998; Schmelzer and Sesselmann, 1998) indicates that self-assessments can lead to improvements in organizational performance. This is not surprising, given that the main purpose of self-assessments is to identify core strengths and improvement opportunities and because self-assessment outcomes can be easily incorporated into business planning. This latter point is in stark contrast to quality audits, whose results typically neither specify nor suggest follow-up actions (Russell and Regel, 1996).

Due to the “holistic” nature of business excellence models (Uzumeri and Tabor, 1997), self-assessments enable people at all levels and all units to search for improvements and integrate them into regular business planning and operations (European Foundation for Quality Management, 1999a). As seen in Figure I, both quality audits and self-assessments typically involve models (ISO standards in the former case, and business excellence models in the latter). However, instead of concentrating narrowly on yes/no compliance questions, self-assessments focus more broadly on
identifying strengths, weaknesses, and improvement opportunities in the areas represented by the BEM criteria.

For example, the European BEM framework contains nine such areas, ranging from leadership and people “enablers” to customer and performance “results” (EFQM, 1999b). Self-evaluations involve measuring deployed approaches’ effectiveness and efficiency in attaining planned results and comparing achieved levels of performance - in each of the BEM areas - with “best-in-class” targets. In other words, the European self-evaluations make comparisons with a constantly-improving “position of excellence” instead of a static reference standard (Kaye and Anderson, 1999).

Self-assessments can measure both organizational effectiveness (i.e. whether it is going in the right direction for improvement) and efficiency (how fast it is going in that direction) whereas audits are limited to evaluating effectiveness only.

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**Figure 2 - Reference Point Requirements for Audits and Self-Assessments (Stanislav Karapetrovic and Walter Willborn, 2006).**
Comparing and Contrasting Audits and Self Assessments as Evaluation Models

Both Quality Audits and Self Assessments are used for a systematic, planned, documented and regular evaluation of organizational performance against reference criteria. Nevertheless, their divergent objectives permeating their evaluation methodologies. While the audit objective is to verify compliance with the criteria, self-assessments are aimed at examining drivers for continuous improvement using the criteria as a framework. In order to achieve the audit objective, we simply need to know two things:

1. the level of performance required (i.e. the STANDARD)
2. our performance level (the MEASURE)

In other words, an audit will tell us whether we are “good” or not (assuming that the meaning of “good” is specified by the standard).

In contrast, self-assessments will tell us how good we are (i.e. where on the scale of “goodness” we stand) by determining the following factors, as seen in Figure 2.

1. the “best” performance level (i.e. the TARGET)
2. the “starting” performance level (the BASE)
3. the distance between “best” and “starting” (the RANGE)
4. our performance level (the MEASURE)

The EFQM (European Foundation for Quality Management) guide emphasizes the importance of gaining and developing senior management commitment and presents five self-assessment approaches (questionnaire, award simulation, workshop, pro-forma and matrix-chart); in comparison, quality audits provide basically a single procedural approach. Although this may initially seem a clear advantage for self-assessments,
EFQM warns that the most effective choice of method depends on the maturity of an organization and on the intensity of effort required for it to perform self-assessments (EFQM, 1999a).

For example, where lower effort is required at the beginning of an organization’s “excellence journey”, EFQM recommends applying the (less-complex) questionnaire and matrix-chart approaches; whereas for mature organizations with a higher invested effort it suggests using an award simulation model. Therefore, the organization’s choice is limited by the fact that none of the self-assessment approaches are universally applicable (Karapetrovic and Willborn, 2006).

Another major difference between quality audits and self assessments concerns auditor independence (ISO 10011, 1991). One of the main principles of quality auditing is that auditors are expected to be completely unbiased with no potential conflict of interest. As such, it is impossible to “self-audit”. In contrast, self-assessments by definition are “examinations of one’s own activities”, and are not necessarily unbiased. (Karapetrovic and Willborn, 2006)

A third difference between audits and self-assessments concerns **perspective**, or who actually does the work. Audits are either **external** (i.e. performed by a customer or an outside formal auditing company) or **internal** (where employees from one part of the organization assess the performance of another). However, self-assessments are performed similarly to internal audits in a process called “third party assessments”, where an external examiner performs the audit (Zink and Schmidt, 1998).
The scope of application represents another major difference. Traditionally, audits are used for function-specific assessments, and are designed and implemented separately for each function in an organization. For instance, a quality audit measures the performance of a quality system, environmental audit does the same for an environmental management system, and an accounting audit verifies the existence of financial controls. Other types of audits, including safety, health, dependability and ergonomic ones, are also focused on the specific aspects of performance. Although attempts have been made to integrate them (Karapetrovic and Willborn, 2000) auditing remains largely function and process-focused. In contrast, self-assessments cover all aspects of business processes, and consequently are cross-functional, emphasizing the overall organizational enablers and results of performance (Caffyn, 1999).

**Self-Assessment Deficiencies**

One possible shortcoming of self-assessments is that it's relatively complex performance data and standards (vs. quality audits) can make it difficult to achieve consensus both on performance indicators' merits and (especially) on what constitutes acceptable quantity and quality for each indicator. The most important questions are: *How does your organization define good performance?* and *Does good performance help your organization attain its mission?* This second point is particularly important for organizations with very diverse stakeholders (Karapetrovic and Willborn, 2006).

Another problem of self-assessments concerns the completeness and reliabilities of the data. Because different approaches use different tools, some self-assessments (e.g. questionnaires) will tend to collect less comprehensive and accurate data than others (e.g. award simulations). Also, self-assessments’ reliability can be compromised by factors
such as the lack objectivity and prejudice of individual assessors (Zink and Schmidt, 1998). On the other hand, auditing methodologies are more rigorous and involve evidence-gathering through observations, interviews, sampling and backward/forward product tracking. Audits strongly emphasize the materiality and objectivity of information to the point where evidence must be fully verified before being used for evaluation. In addition, auditors are specifically trained to assess data’s risks and reliability. Objectivity and independence of evaluation are also amongst the key principles of auditing.

Interestingly, the principles underlying two key self-assessment methods suggested by EFQM (1999a) for mature organizations (the workshop and the award simulation) are similar to those that underlie quality audits. In the workshop method, two assessors - one from the unit being assessed and the other from a different unit or from an external organization - perform the assessment (EFQM, 1998a). In the award simulation method, another organizational unit or an outside party submits a report explaining how the organization has addressed the EFQM (1999b) criteria to external quality assessors. Therefore, both methods can support auditing’s independence principle by having an outside party provide an independent, unbiased, outside perspective. This is similar to quality audits, wherein organizations submit ISO 9000 quality system documentation to independent registrars who evaluate the documentation and follow up with site visits (award simulations are the only self-assessments that site-assessments, which EFQM (1999a) refer to as “value-adding activities”. A combination of SA techniques, a.k.a. the “peer” approach, also utilizes external managers as assessors (EFQM, 1999a) (Karapetrovic and Willborn, 2006).
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<tr>
<th><strong>Audit</strong></th>
<th><strong>Self-assessment</strong></th>
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<td>“Systematic, independent and documented process for obtaining audit evidence, and evaluating it objectively to determine the extent to which audit criteria are fulfilled” (ISO 9000, 2000)</td>
<td>“Comprehensive, systematic and regular review of an organization’s activities and results referenced against a BEM” (EFQM, 1999a)</td>
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<tr>
<td>“Human evaluation process to determine the degree of adherence to prescribed norms (criteria, standards) and resulting in a judgement” (CSA Q395, 1981)</td>
<td>“Carefully considered evaluation resulting in an opinion or judgement of the effectiveness and efficiency of the organization and the maturity of the quality management system” (ISO 9004, 2000)</td>
</tr>
<tr>
<td>“Independent and documented system for obtaining and verifying audit evidence, objectively examining the evidence against audit criteria, and reporting the audit findings, while taking into account audit risk and materiality” (Karapetrovic and Willborn, 2000)</td>
<td>“Approach which is used to underpin continuous improvement by measuring an organization’s current performance against a model which represents a position of excellence” (Kaye and Anderson, 1999)</td>
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<tr>
<td>“A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives” (ISO 10011, 1991)</td>
<td>“Tool to systematically monitor and control a company’s continuous improvement process” (Zink and Voss, 1998)</td>
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**Figure 3 - Selected Definitions of Audit and Self-Assessment** (Stanislav Karapetrovic and Walter Willborn, 2006).

For purposes of developing the Route Evaluation tool (documented later), I considered the most relevant definitions of “self-assessment” to be first two presented in Figure 3.

When planning and executing a series of audits ("audit program" in ISO 10011, 1991) or self-assessments, both methodologies follow the plan-do-check-act circle (Table II). In the planning phase, the objectives and required resources are identified, including the management, scope and procedures. Reflecting the more formal approach of the auditing methodology, a whole part (one of three) of the ISO 10011 (1991) standard is devoted to the management of audit programs, the authority for which is given by the executive management. (Karapetrovic and Willborn, 2006)
Because quality audits are usually the result of external forces (van der Wiele et al., 2000b) they are less effective at achieving successful quality improvement; this contrasts with self-assessments, which are intrinsically motivated.

Although quality audits and self-assessments may appear to share the same objective, the divergent nature of their reference criteria has caused them to have different principles and application methodologies; likewise, whereas audits and assessments may appear to have similar processes, they differ significantly in their primary functions, principles, and their ability to generate useful improvement ideas (Karapetrovic and Willborn, 2006).

Another significant methodological difference between QAs and SAs lies in scoring. As mentioned before, audits typically just verify the presence or absence of quality system elements, in a binary fashion. In contrast, self-assessments typically use a number of scoring levels. For example, the ISO 9004 (2000) standard uses five

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### Plan-Do-Check-Act Circle of Audit and Self-Assessment Programs

<table>
<thead>
<tr>
<th>Plan</th>
<th>Audit (based on ISO 10011, 1991)</th>
<th>Self-Assessment (from EFQM, 1999a)</th>
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<tr>
<td></td>
<td>Identify organizational structure and required competence for audit program management</td>
<td>Develop commitment</td>
</tr>
<tr>
<td></td>
<td>Define audit program objectives, scope, roles and responsibilities</td>
<td>Select approach and scope</td>
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<tr>
<td>Do</td>
<td>Identify audit teams</td>
<td>Establish self-assessment teams</td>
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<tr>
<td></td>
<td>Ensure competence and suitability of auditors</td>
<td>Train and educate</td>
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<td></td>
<td>Communicate audit plan</td>
<td>Communicate plans</td>
</tr>
<tr>
<td></td>
<td>Manage the planning and execution of individual audits</td>
<td>Execute assessment</td>
</tr>
<tr>
<td>Check</td>
<td>Identify required corrective actions</td>
<td>Identify required actions</td>
</tr>
<tr>
<td></td>
<td>Perform follow-up actions and/or audits</td>
<td>Incorporate actions into plans</td>
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<td></td>
<td>Monitor, evaluate and maintain auditor performance</td>
<td>Implement plans</td>
</tr>
<tr>
<td>Act</td>
<td>Review and improve the audit program through feedback and recommendations from the client, auditee and auditor</td>
<td>Review improvement progress</td>
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Figure 3 - Plan-Do-Check-Act Circle of Audit and Self-Assessment Programs (Stanislav Karapetrovic and Walter Willborn).
“performance maturity levels”, whereas the EFQM (1999a) guide provides three scoring choices:

(1) none at all
(2) the qualitative Pathfinder tool
(3) the quantitative Results/Approach/Deployment/Assessment/Review (RADAR) method

RADAR involves “zero to 100%” measurements of data (pertaining to people, customers, society and performance) for indicators as trends, targets, comparisons, causes and scope. It measures performance enablers such as how sound and integrated the approach is, to what extent has the approach been implemented, and the scope of evidence for measurement, learning and improvement activities.

Although the methodologies and underlying principles of QAs and SAs may appear to be similar, significant differences do exist. Audits are more procedural and formal (van der Wiele et al., 1997), whereas assessments are more declarative and flexible. Therefore, it is not surprising that numerous software packages exist for conducting internal quality auditing against ISO 9000 standards, whereas, according to Caffyn (1999), few such packages exist for evaluating continuous improvement. Another indication of this formality is the thorough and comprehensive process of training and certifying auditors as documented in large sections of the ISO literature. Although such rigor does assure professionalism and high-quality evaluations, its complexity restricts it to professionals from a single business function discipline (quality) and consequently auditors are less able to comprehensively evaluate the whole organization. This conclusion is in line with Zink and Schmidt’s finding that a “mechanistic execution” and
the assignment of auditing responsibilities to the "traditional quality department" can jeopardize the success of self-assessments (Zink and Schmidt, 1998).

As seen in Figure 2, quality audits and self-assessments both have common initial processes for collecting and evaluating data and they both result in finding deficiencies and identifying areas needing improvement. However, the two methodologies deal with results quite differently, and this may account for why self-assessments are more likely than quality audits to bring improvement.

Audits end with a formal report that identifies the need for corrective actions and highlights the areas where a quality system would be helpful. Since "the audit is completed upon submission of the audit report to the client" (ISO 10011, 1991), at this point the quality process stops. Although an outside party has generated the list of required changes, the responsibility for action lies with the auditee. Because imposed changes rarely work, the link that could drive quality improvement is broken. On the other hand, self-assessments ensure that the people identifying and approving the changes are the same ones who actually make the changes (by benchmarking, development of improvement plans, incorporating them into the overall business planning, taking actions, and review). Therefore, because the "improvement circle" is fully closed, the self-assessment is able to initiate continuous improvement (Karapetrovic and Willborn, 2006).
**Conclusion**

The shortcomings of quality audits in ensuring continuous improvement suggest that they should be dropped altogether in lieu of self-assessments. However, doing this would ignore the many advantages quality audits provide, including their objectivity, independence of evaluation and recommendations, as well as a solid assurance of the existence and operation of a quality system, as described in a relevant standard (Karapetrovic and Willborn, 2006).

Direct alignment and integration could be achieved by applying audits and self-assessments to different areas of the business. For instance, audits (with their accuracy and objectivity) could be used to identify “hard” controls and existence of systems, whereas self-assessments could be used for “soft” aspects such as people involvement and leadership. Audit results could be fed into the self-assessment process and eventually incorporated (via the self-assessment outcomes) into business planning. Therefore, self-assessments and quality audits would be considered as complementary rather than as substitutes for one another (ISO 9004, 2000). External audits would still be applied for registration purposes. (Karapetrovic and Willborn, 2006).

Interestingly, the accounting profession witnessed a similar situation regarding internal auditing in the late 1980s when there were calls for replacing traditional audit (TA) techniques with the control self-assessment (CSA) methodologies (McCuaig, 1998; Figg, 1999). Today, according to Figg (1999) and Foh (2000), these two techniques are used in a complementary fashion, with Total Audit (TA) applied to “hard” controls such as finances, and CSA to “soft” controls such as communication, staffing, ethics and training. Therefore it is plausible to create a hybrid model for evaluating quality system
performance that incorporates both auditing and self-assessment, thereby enhancing the
advantages and eliminating the faults of both in the process.

It is also possible that in situations where strengths or weaknesses have been
identified in quality management processes or systems, quality audit outputs can become
self-assessment inputs. For example, when embarking on the implementation of an ISO
9000 quality system, it is customary for organizations to use a self-assessment (known as
a “gap analysis”) to identify the areas of weakness (Willborn and Cheng, 1994). Such
interdependence can improve the compatibility and alignment of the two methodologies.
Several authors have already pointed out the importance of interdependent self-
assessments (e. g. Kaye and Anderson, 1999; Zink and Schmidt, 1998), as well as audits
(e. g. Karapetrovic and Willborn, 2000). Mutual compatibility would provide even
greater benefits.

Overall, due to numerous differences in the concepts, purpose, scope and
methodology of self-assessments versus quality audits, the former are found to be more
effective at enabling continuous improvement. However, because audits and self-
assessments are compatible, and further research into the issues of enhancing both
methodologies is suggested (Karapetrovic and Willborn, 2001).
Figure 4 - Individual Audit and Self-Assessment Processes (adapted from Karapetrevic and Willborn, 2001 and EFQM, 1999a)
PRIOR NORTHERN HEALTH CONNECTIONS RESEARCH

Two previous reviews of Northern Health’s Connections program have been conducted, the first one being an external evaluation by Dr. Jalil Safaei, an Economics professor with the University of Northern BC, and the second one an internal review of the first three years of operation by Ms. Ashley Stoppler, Northern Health’s Regional Manager of Patient Transportation. Although a detailed presentation of these two reviews is outside the scope of this paper, they can be summarized as follows:

Dr. Safaei’s research had three objectives: a) to evaluate the efficacy of the Connections transportation service in terms of enhancing rural and northern BC communities’ access to healthcare services, b) to analyze the usage patterns and the passengers’ reasons for using the service, and c) to capture the passengers’ perceptions and ratings of the service. After studying the various attributes (demographic, socioeconomic, health, usage, service perception, etc.) of the passengers, Dr. Safaei composed accurate passenger profiles and concluded that program was successfully achieving its primary objective (Jalil Safaei, 2009).

Ms. Stoppler’s review concluded that although the service has built a strong clientele, it is important to not rest on the success of the program to date. Working together, the NH Connections team continues to strive to improve the program by finding new and creative ways to provide service to as many clients as possible (Ashley Stoppler, 2009).
While both reviews provided a good assessment of passenger satisfaction, neither one discussed how the performance of individual routes can be assessed. Therefore, that is the objective of the business tool described in this paper.
BUSINESS TOOL DESIGN AND IMPLEMENTATION

Business Tool Rationale

A business tool to evaluate the feasibility of the Northern Health Connections routes will provide valuable guidance into the future direction of the program. In general, the more complete and detailed one's knowledge is the better one can make improvements based upon that knowledge. This view leads us to some fundamental questions, the answers to which will indicate an appropriate business tool: What are we trying to accomplish? How will we know that a change is an improvement? What changes can we make that will result in improvement?

Northern Health Connections Routes

As mentioned previously, the Northern Health Connections covers a large geographical area. This section presents a more detailed view of the communities served. Table 1 lists the communities served by the NH Connections program and its affiliates. Because Connections travels to several communities outside the NH region (i.e. in the Interior Health region), these communities are also listed; although Connections does not promote the program in these communities, it serves them when space permits (NH clients are always given priority over those from other health authorities).
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<thead>
<tr>
<th>Community</th>
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<td>Hudson's Hope</td>
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<td>(Interior Health)</td>
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<td>Clearwater (Interior Health)</td>
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Table 1 - Communities Served by Northern Health Connections
Figure 6 depicts the general route structure of the program.
Evaluation Questions

Although Dr. Safaei’s report confirmed that the system is operating satisfactorily, it is important to regularly evaluate whether routes should be added, changed, or removed. Ms. Stoppler noted that “given the nature of the current economic situation as well as our general industry, there are not unlimited dollars to provide any service. As such, we need to continually be examining our activities to ensure that we are providing the necessary services in the most effective and efficient way possible.”

It is also important to note that the demand for service continually fluctuates across the 19 different Connections routes, with the ridership ranging from virtually none (i.e. averaging 3 riders/month) to high (322 riders/month). Ashley Stoppler, Regional Manager of Patient Transportation. For example, this past September, demand variations necessitated the reallocation of the “Burns Lake to Smithers” route to the “Mackenzie to Prince George” route. Clearly, there is a need for a self-assessment tool with which to monitor routes on an individual basis.

If Northern Health were only in the transportation business, a simple solution would be to have ridership volume as sole indicator, and adjustment decisions would be relatively easy. However, because Northern Health does far more than simply move patients around, many other factors (alternative modes of transport, socioeconomic status of clients in that community, distance to healthcare providers, etc.) must be considered. This makes routing far more complex, thus necessitating a self-assessment tool with which to measure the routes’ effectiveness.
**Intended Use of the Business Tool**

The business tool will evaluate service levels that Northern Health Connections provides to its client communities, thus generating valuable information for future route design decisions. I examined similar tools and determined that a ranking system would be difficult to compare communities with such divergent needs. For example, this could put smaller communities at a distinct disadvantage to larger ones.

What is required is a tool is consistent in its application and also flexible to accommodate changing decision factors. As discussed in the literature review, both quality audit and self-assessments tools can benefit an organization, and the Northern Health Connections Route Evaluation Flow Chart (Figure 8) combines these two methods. The following will specifically identify the characteristics that apply in the design of the flow chart.

The flow chart uses a very formal procedural approach (as does a quality audit) that guides the user through a logical chain of questions, thus reliably and consistently addressing key concerns of Northern Health Connection users.

However, the tool also has the “variability” aspects of a self-assessment tool (e.g. in the decision on how to offer the service). Finally, it is tightly linked to Northern Health’s business planning.
Methodology for the Design of a Route Evaluation Tool

I began by reviewing Jalil Safaei “Northern Health Connections Evaluation Report” and Ashley Stoppler’s “A Review of the First Three Years of Operation Reports”. Then emails were sent out to key Northern Health personal for input in of their needs, I analyzed the feedback that was received identifying the required information the tool would need to provide. Next I incorporated the feedback into the Self Assessment Evaluation Tool, the draft tool was then discussed with Ashley Stoppler, finalizing the Northern Health Connections Route Evaluation Flow Chart.
Methodology for the Design of a Route Evaluation Tool

I reviewed Jalil Safaei’s “Northern Health Connections” Evaluation Report

Section: Prior North Health Connections Research

I reviewed Ashley Stoppler’s "Northern Health Connections: A Review of the First Three Years of Operation"

Section: Prior North Health Connections Research

Emails where sent to key Northern Health personal for input in of their needs

Feedback was received that identified the required information a tool would need to provide.

I incorporated the feedback into the Self Assessment Evaluation Tool. The draft tool was then discussed with Ashley Stoppler, Northern Health Connections, Regional Manager of Patient Transportation.

Section:

I finalized the Northern Health Connections Route Evaluation Flow Chart Tool (NHCEFC)

Section: Business Tool Developed: Northern Health Connections Route

Figure 6 - Methodology for the Design of a Route Evaluation Tool
Operational Considerations

The primary operational consideration is ridership numbers, as they affect the number of buses that may be required (Ashley Stoppler, 2009). Both long-distance and short-distance services have seen dramatic ridership yearly increases (141% and 47% for long-distance, and 122% and 41% for short-distance). The “Prince George to Vancouver” run has had ridership increase by 208% and 60% over the last two years (Ashley Stoppler, 2009).

Seasonal variability must also be considered. For example, ridership is higher during the fall and winter months and there is a slight decrease in riders over the Christmas period (Ashley Stoppler, 2009).
Figure 7 - The Northern Health Connections Route Evaluation Flow Chart
The Northern Health Connections Route Evaluation Questionnaire

Route name: ________________________________
Day(s) of Service: __________________________
Date of Review: ____________________________
Reviewed by: ______________________________

Following the NHC Route Evaluation Flow Chart, please answer the following questions to assist in reviewing individual routes. Evaluation should be completed for each route on a quarterly basis.

- What is the average utilization of the route (# of riders divided by # of seats)?
- What is the average utilization of this type of route (short haul vs. long haul)?
- What is the cost/rider for this route (total cost: # of riders)?
- What is the cost/rider for this type of route (short haul vs. long haul)?
- What healthcare services are offered in the home community (GP, dentist, specialists, mental health, and addictions)?
- What is the burden of illness in the home community?
- What is the percentage of elderly residents in the home community?
- What is the socioeconomic status of the population?
- What is the economic outlook of the community (mines/mills or tourism developments planned or approved and if so what is the expected impact on the community)?
- What if any, travel alternatives serve this route?
- What are the costs to users of the travel alternatives?
- Are the alternatives accessible?
- Is the route wheelchair accessible?
- Do travel times along the route allow for sufficient appointment time?
- Is the route offered at least once per week?

Additional comments: _____________________________________________________________
Discussion

After a review of the Northern Health Connections evaluation report by Jalil Safaei and discussions with Ashley Stoppler Regional Manager of Patient Transportation at Northern Health, I was able to determine that there was a need to develop a tool that will evaluate the transportation options available while still providing patients' with the opportunity to receive healthcare services not available in their community.

From reviewing Dr. Safaei's report and interviewing Ms. Stoppler, I first developed a questionnaire that would assist with determining the needs of passengers on various Northern Health Connections routes. I organized these questions logically to address factors such as the route's current utilization, current cost per rider, the state of the community (e.g. health-wise and socioeconomically) as well as the availability of alternative transportation.

Then I created a visual companion to the questionnaire (i.e. a flow chart). The flow chart guides the reader through the questionnaire logic so that he/she either identifies a Northern Health Connections need or determines whether the route would be better served by another mode of transportation.
CONCLUSION

The Northern Health Connections Route Evaluation Flow Chart (REFC) will assist Northern Health as a performance measurement tool for gauging the success of the Northern Connections program. The REFC’s versatility will benefit the Northern Health operations as it addresses varying needs by providing a range of healthcare options to the communities.

The REFC is straightforward and will provide Northern Health leadership with the ability to modify the program as required and implement continuous quality improvement. Because the tool is not a complex, process-oriented program, management should find it easy to use.

The REFC demonstrates characteristics of a self-assessment tool; it identifies the core strength of the Connections program (i.e. its consumer focus) and it provides flexibility for different reactions to various scenarios. Also, unlike a quality audit, the REFC is easy to link with follow-up actions because it moves the user logically along until they reach a decision.

I am confident that as a total quality tool, the REFC flow chart / questionnaire process will provide Northern Health with useful business planning information, and that it will enable continuous improvement in the quality of challenging route operation decisions. Because it asks consumer-focused questions (such as the percentage of seniors in a community) the REFC will provide consumer-centered outcomes. I recommend that the REFC process be reviewed quarterly basis to ensure that the tool is validated and that Northern Health’s healthcare access objectives are achieved.
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