

# Establishing Skills and Competences for the Modern Statistical Office in a Learning Organization

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## Abstract

This paper focuses on the role of Statistics Netherlands' internal training institute, the CBS Academy (CBSA). We describe the strategic goals of CBS, focusing on its aim to become a learning organization. In this context we describe the history, structure and approach taken by CBS Academy. We also detail its curricula, the approach to driving CBS to becoming a learning organization and end with some of the challenges still faced by CBSA.

**Keywords:** Modernization, Education, Learning Organization, Competences

## 1. Introduction

Statistics Netherlands (CBS), like many other statistical offices is facing an increasing demand of faster and more flexible statistical output, while at the same time it is expected to quickly incorporate new data sources into statistical production. This increasing pressure on both input- and output side puts considerable pressure on statistical organisations to innovate and move towards flexible production systems and organisation. At the same time, CBS is operating in an increasingly competitive labour market, which makes it hard to recruit and retain talented employees.

In order to meet these challenges, CBS is simultaneously executing a number of modernisation programs, on the level of (organizing) statistical production and output, on the level of IT and infrastructure, and on the level of human resource management. The modernisation in the area of statistical production, output, and IT is guided by a series of strategic documents where basic (generic) choices are made. For example, the business architecture prescribes the generic design of production systems, which ought to follow a limited number of separate steps moving from raw input data via standardized quality levels to publication-ready output data. The IT landscape is guided by an application architecture, and a new data strategy describes the move towards a data-centric organisation where data silos that are local to a part of the organization no longer exist.

In the area of statistical production and output, CBS is executing five programs to modernize production. On the input side, CBS has developed a central data portal that handles and makes available (almost) all input data in a standardized way. There are two large programs in the areas of social and economic statistics. Both programs aim to bring all statistical production systems in line with the main architectural choices, namely: a *modular and composable* design that allows for fast, reliable, and flexible building of production systems; a *standardized choice* of IT tools, methodology, processes and data; *reuse* of IT, methodology, processes and data where possible; and separation between subject matter and technical choices by developing *rule-driven* (metadata-driven) data processing systems. Supporting these innovations is a cross-cutting, third project called 'data central'. This project aims to design and build an internal

'data market place' where intermediate data is stored and made available using standardized storage and metadata. The aim of this project is to both facilitate data standardization and internal data sharing. It will also implement an internal classification server that hosts standard classifications to be reused across the office. The fifth project focuses on the output side. CBS is renewing its main output facility (StatLine) with a new system and process based on SDMX.

In the area of modernizing the application landscape, CBS is moving towards cloud-native software development supported by a containerized infrastructure. The promise of cloud-native development is to improve maintainability, scalability, and agility of the application landscape. Moreover, it allows CBS to connect to industry standards which also improves its status on the labour market.

Modernizing CBS' primary and secondary processes in so many areas logically will affect the day-to-day work of many staff members. At the same time, CBS has faced a significant outflow of retirees, while the labour market in the area of data and IT is increasingly competitive. For these reasons CBS has adopted an HR strategy in early 2020 that emphasises five strategic directions, including progressive recruitment strategies; continuous learning as a standard; supporting management development in a CBS-wide context; stimulating vitality of the work force, and interpreting outflow of staff as an opportunity, not a threat. Implementing the strategy has already led to several changes, such as a new recruitment procedure, updated on-boarding courses, numerous activities addressing vitality and inclusivity, an extensive management development program and more. In 2019, CBS has also established an internal training institute, CBS Academy, that is responsible for all training of all staff within the office.

In this paper we focus on the role of the CBS Academy (CBSA) in the strategic development of CBS. In the following sections we first describe the CBS Academy, its history, mission, structure and main achievements. We also focus on how CBSA contributes to modernizing formal education. In section 3 we provide details on the curricula for formal learning. We focus in particular how the substantive curriculum is designed to support modernisation of statistical production. Section 4 is devoted to the introduction of informal learning and the move towards becoming a Learning Organization. In Section 5 we summarize our experience and identify some key challenges for the coming time.

## **2. CBS Academy**

CBS Academy was established as the central educational institute for all internal and external education in 2019. Prior to 2019, most courses had been developed and taught by the department of methodology, except courses in substantive areas, such as National Accounts or Price Indices, which were taught by subject matter specialists from the statistical divisions. Divisions would also have budget to acquire courses externally. With the establishment of the CBSA, 80% of the budget for education that was allocated locally at the divisions was centralised.

Initially, CBS Academy took over organization of the onboarding and methodological courses taught by the methodology department. The curriculum was quickly extended in the area of IT and data science in the area of Official Statistics. This was to an extent driven by a collaboration with the Ministry of Internal Affairs, that sent data science trainees to CBS for training. CBS Academy also acquired trainings in the area of personal development, career planning and communication, and ran an extensive management development program for all managers at CBS, including top-level management. The Academy currently offers internally organized trainings, acquires external trainers, and organizes access to e-learning platforms.

Besides that, CBS Academy has been involved in organizing events such as the CBS 'learning month', and in developing activities to professionalize internal trainings and trainers.

From 2022 the collaboration with the Ministry of Internal Affairs slowly started coming to an end. Together with some staff changes this gave CBS Academy some repose to reconsider its mission within CBS. By that time CBS Academy had also become a driving force for the transition of CBS into a learning organization. These developments lead to the new and current vision for CBS Academy, as well as a vision on substantive skills and competences for statisticians in the modernized statistical offices.

The following subsections will detail the current vision and mission of CBS Academy, its main activities, and how it is structured, and how CBS Academy aims to modernize and professionalize internal training activities.

### **1.1 Vision and Mission of CBS Academy**

In 2023 CBS Academy adopted the phrase *Partner in Development*. This slogan expresses the fact that CBS Academy wants to be the main partner for development and educational questions within CBS but it also expresses that CBS Academy and its staff is always developing itself. The vision for CBS Academy has five components.

The first component is *connecting to practice*. CBS Academy wants to stay in close touch with the current and future needs of the work force. Structural contact is made through a formal sounding board group with representatives from all divisions. The group meets frequently and is also consulted on additions or changes in the curriculum. The group members serve as 'ambassadors' for the Academy within the organization. Moreover, in 2024 the Academy is conducting a 'road show', visiting each management team at CBS. The aim is to explain the Academy vision and services and at the same time retrieve information on current and future needs within each team. Based on collective learning needs, the curriculum and other services can be geared towards the organization.

The second component is *competence-focused development of talent*. Since 2021-2022, the CBS HR department has adopted a government-wide standard for staff functions, and customized it towards CBS needs. For each function type, so-called 'development lines' have been developed that describe how important certain types of skills are in four levels of career development, from junior to senior. The skills and competences are always divided into substantive, personal, team, and environment. Depending on the function, particular skills and competences are chosen. For example, substantive skill for a policy officer may be legal knowledge, while a statistical researcher has 'statistical methodology' as substantive skill. These development lines are to be used by management to discuss the current situation with their staff, and to decide on desired development. They will also serve as the backbone for a connected curriculum, where formal and informal learning interventions can help taking staff from one level to the next. Under the same principle the Academy is working to set up a trainee program for new employees and supporting internal teachers in developing courses and their pedagogical skills.

The third component is the aim to *increase (informal) learning effectivity*. This is effectuated by following a strict PDCA cycle for each training round. Every learning activity is evaluated by participants, followed by a discussion with the teachers. Evaluations are archived, and where necessary agreements on improvements either on the side of the Academy or on the side of the teachers are made.

The fourth component is that CBS Academy wants to be the *driver behind the transition to a learning organization*. An action plan was drafted in 2022 and started in 2023. The plan includes an awareness campaign and a sequence of activities to stimulate a cultural change that makes learning a normal part of ordinary work (see also Section 4).

The fifth and last component regards *sharing of knowledge*. Both internally and externally. Staff at the CBS Academy is stimulated to update their knowledge and to visit events themed around professional development and education. The CBS Academy team also sees itself as a laboratory to test out new products and methods. For example, by trying new games and group activities in the topic of inclusivity and social safety.

## **1.2 Organization and Main Activities**

CBS Academy is a team under the HR department. It consists of a team manager, two administrative staff, three program managers that are responsible for curricula around personal, management, and organization development; a senior education advisor and a (part time) application manager for digital services. Two methodologists are rented part-time to run the substantive curriculum, since almost all trainings in that area are provided by CBS staff. In total, CBS Academy comprises about 5.5 FTE, offers around 120 learning activities annually, and has a substantive curriculum with about 80-100 CBS staff members involved annually. CBSA provides access to two major e-learning platforms, acquires dozens of external courses, and serves as consultancy for finding custom trainings within CBS.

Trainings that are part of the standard curriculum can all be found via the central administrative system of CBS. Participants can register and deregister through a standardized landing pages for each training. Participation is now also monitored systematically, giving CBS Academy and management insight into the amount of trainings followed. In 2023, almost half of CBS ~2000 employees followed at least one training. Originally, trainings were planned on year-by-year basis. However, with improved knowledge on waiting lists and participation, planning is moving towards a more data-driven, rolling agenda that more closely caters the immediate needs.

Besides organizing the formal trainings, CBS Academy organizes a 'learning month' with external and internal speakers, is part of organizing the CBS innovation week, runs an awareness campaign surrounding the concept of learning organization (see Section 4), and strives to modernize educational practice within CBS (next section). CBS Academy is since 2022 also responsible for organizing the trainings under the European Statistical Training Programme (ESTP) in which CBS staff participates.

## **1.3 Internal Trainers and Modernizing Education**

It was decided early on that most of the substantive curriculum is to be executed by CBS staff. Working with internal staff as trainers has several advantages. One advantage is that it allows (senior) staff to transfer some of their knowledge to colleagues. It also extends their internal network with people that are interested in their topic, and establishes them as one of the main internal experts in their field. Moreover, teaching a topic to a wide audience strongly contributes to the expertise of the trainer. Interacting with a broad range of participants often confronts teachers with new questions or new contexts for use of their knowledge. A disadvantage of working with internal teachers is that they are usually not schooled pedagogically and often have little experience with modern educational working methods. A second disadvantage is that there is a risk of 'navel-gazing', in the sense that CBS does not bring in enough knowledge from outside.

To professionalize and modernize internal teaching, CBS Academy supports internal teachers in developing their educational skills, and also offers support when developing new courses or updating course material.

Considering the up-skilling of internal teachers, CBS Academy organizes annual teacher days where all teachers are invited. Days have been themed around modern working methods such as different forms of Active Learning and Blended Learning; around course design; and around didactic skills. Trainers with more substantial teaching loads have been offered 'train-

the-trainer' courses to improve their course design skills and to inspire them to use modern formats, such as blended learning or flipped classroom. Currently whenever CBS Academy sets up a new course, the course leaders are offered support by Academy staff to design, shape and create their course. The help ranges from providing quick feedback and suggestions as a sparring partner, to get involved deeply in planning and designing the course. It is left up to the trainers to express the amount of help desired. The feedback from trainers to this has been overwhelmingly positive, and generally the participants to such trainings tend to be very positive on the chosen work methods.

Recently, CBS Academy has started to experiment with 'guided e-learnings'. The idea is that many (free or commercial) e-learnings are available via online platforms. However, the completion rate is famously low (see e.g. Kizilcec *et al* 2020). Therefore, CBS Academy is organizing cohorts of people who combine e-learnings with in-person meetings, guided by an internal trainer. The role of the internal trainer is to help guide the participants through the exercises, and to add CBS-specific knowledge. We have implemented two courses in this way: a beginner's course on data analyses with Python, and a course on 'Performant SQL'. The first evaluations revealed that it is useful to teach participants in a preparatory meeting how to follow an e-learning: open the video and copy all activities (coding, in this case) that the teacher does in a second screen; pause frequently to do so. A second insight is that even though participants are aware that they join an e-learning cohort, they still may have a hard time finding time for the e-learning part of the course. One solution is to ask them to block specific hours in their agenda. This can even be done during the preparatory meeting.

In the future, CBS Academy would like to move from separate internal trainers to a community of trainers that know each other and exchange experiences, tips, and tricks. For this reason, future activities will contain larger elements of intervision, and trainers will also be invited to be involved in the organization of their own development. For example by co-organizing the teacher days.

A risk of using internal trainers, is over-focusing on techniques and knowledge that is used or developed locally. This is why CBS Academy is looking into ways of bringing in external teachers, for example of other government agencies, but also perhaps in to exchanging trainers between NSIs. The latter also has as an advantage that it will provide internal trainers with international experience that is necessary to qualify for teaching within the ESTP program.

Finally, one of the main challenges is to find sufficient internal trainers. On one hand because the most senior experts often have a full agenda leaving little time for developing and conducting trainings. On the other hand, management often feel that giving trainings does not directly contribute to local productivity, yielding to low prioritization of training activities. One way forward taken is to not only focus on senior experts: many introductory courses can be taught by less experienced staff as well. A second way is to realize that teaching is a long-term investment that ultimately also works in the advantage of the team that supplies the teacher. For example, CBS Academy is organizing basic courses on the legal system surrounding government and official statistics for non-legal professionals. The expectation is that this allows people to ask better questions to the legal department, and in some cases may even prevent the need for legal questions. Both effects will increase the efficiency of our legal team. The same can be said for methodology, or IT: it is easier to give methodological (IT) support to people who have some basic methodological (IT) knowledge, since it avoids much translation between subject matter language and the language of a methodologist (IT staff).

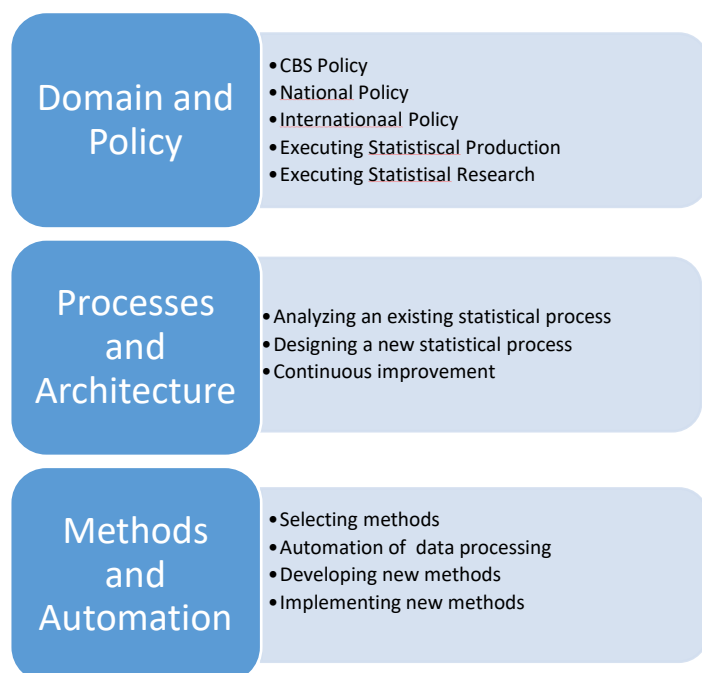
### **3 Curricula for formal learning**

CBS Academy organizes both formal trainings and stimulates informal learning. The formal learning is organized around three curricula, each of which is developed by a dedicated program manager. The curricula are established from two types of input. On one hand, CBS

Academy aims to contribute to the strategic direction of the CBS, and fills the curriculum with trainings that relate to those goals. On the other hand, CBS divisions may have immediate learning needs that may be of broad enough interest so that they can be accepted into the general curriculum. In both cases there is coordination with the sounding board group and if necessary other stakeholders.

### 3.1 Vision for the Substantive Curriculum

Based on the CBS vision on the shape of modern production systems, a vision document was developed that describes the skills and competences that are necessary in a modern statistical office (van der Loo, 2022). This document serves as a guide to develop the substantive curriculum. We remind the reader that the goal architecture for production systems and processes is based on the principles of *modularity* and *standardization* of IT, Process design, IT, and methods; on *separation of technique from domain knowledge* and a maximization of *automation*. In the vision on competences and skills, the vision on production systems and aspects of domain knowledge are taken into account. This yields three main competence areas, that are split in to sub-areas as shown in the diagram below.



Each competence, such as ‘CBS policy’ has been defined precisely; and for each competence a list of skills and a list of knowledge items is defined, together with an example and where possible references to existing ontologies are added, such as to the European Skills, Competences, Qualifications and Occupations (ESCO) standard. This results in a one-page fiche for each competence. It should be mentioned that we also use a specific definition of skills, and competences, and knowledge in this context. A ‘skill’ in this context means the capability of doing something with ease, or almost thoughtlessly. A ‘competence’ is the ability to combine skills and knowledge to perform a complex task.

For example, the definition of ‘CBS Policy’ is *the ability to set up and perform statistical processing according to internal CBS policy and working methods*. Skills include *recognizing CBS policy choices that are relevant to one’s own work*; and *applying CBS policy choices in the area of architecture, processes, methods, and quality in their own statistical production*

*situation*. The list of knowledge items includes knowledge of documented policies such as *the CBS Business Architecture, division-specific design choices, CBS quality guidelines and standard methods, CBS policy in the area of disclosure control, IT security policy, and relevant points of contact in the organization, such as the Chief Methodology Officer, Chief Quality Officer, and more.*

Of course, not every statistician is expected to have all competencies and skills listed. However, it is recognized that the full list of skills, competencies, and knowledge is needed for a team or sector to be able to work according to modern standards.

During its development, the vision document has been shared with various actors, including the statistical divisions, IT, HR and the sounding board group of CBSA for feedback and to gain support. Since its finalization it has guided the further development of the substantive curriculum. Traditionally, the curriculum had been filled with courses in the area of (classical) methodology, data science and programming in R and Python. In the section of Methods and Automation there are now also courses in software engineering (future-proof automation) for statisticians and a course on software quality. In-depth specialist courses on methodology are now complemented with light-weight workshops, such as a three-hour workshop on 'sampling theory without mathematics', to cater any CBS employee. There is also a one-day workshop on software quality for (project and team) management. Furthermore, there are workshops on innovative products resulting from CBS' research program, such as a three hour workshop on the use of satellite data. A workshop on complexity and network science is planned. All new courses have been co-designed by CBS experts and CBSA staff who strongly emphasize an active learning approach. For example, even in the three-hour workshop on satellite data (no specific prior knowledge is expected) all participants will gain some hands-on experience by browsing through the information of ESA's online Sentinel Portal and gain inspiration for applications in their own field. In the area of Processes and Architecture, there is a new course on business architecture that is partially based on the ESTP course in that area; and a new course on process analyses where statisticians learn to analyze and modularize the statistical processes they work with every day (for involved projects, CBS has a team of dedicated analysts as well). In the area of substantive knowledge and policies, there are new courses on economic statistics, a training 'law for non-lawyers' and a training on the CBS law. Trainings on the CBS quality framework that is currently under development are under development.

As a side-effect the vision on the substantive curriculum has guided a discussion in the division of Social Statistics, where management is currently redefining the standard roles within statistical teams. The new roles are constructed from competences of the vision document. This has amongst other proposals lead the formal introduction of the role of Research Software Engineer.

### **3.2 Personal Development**

The personal development curriculum offers trainings the area of personal effectivity, career, communication, and vitality. Almost all courses are acquired via third parties. Example courses include an application course, working on your career; *power of introverts*, trainings on feedback and communication, negotiation, personal leadership, effective consulting, growth mindset, and practical skills such as working visually (mind maps, process drawing, visual reporting,...) and time management time management.

### **3.3 Organization Development**

The Organization Development curriculum is also mostly acquired from third parties. There are trainings in the areas of Agile working and Scrum, team development, project management, and lean six sigma and continuous improvement.

A particularly interesting project to mention is the workshop on 'peer coaching'. CBS is running a pilot project where a number of its employees are trained to be peer coach. A peer coach is an employee who besides their usual work are available to coach a colleague in their work situation. The idea that peer coaches have a lower barrier to approach than a formal confidant. People who feel the need to talk to a coach can approach them directly. There are no formal procedures. Rather, a staff member aims to find a coach with whom he has a natural match.

Issues for coaching are typically in the sphere of soft skills and personal development. Examples include issues with working in a team, perfectionism, fear of failure, dealing with conflicts or resistance, dealing with feedback, setting boundaries, but also topics like work-life balance and time management can be discussed. The training for peer coaches focuses on the boundaries of coaching, communication models for coaching, do's and don'ts in coaching conversations and practice sessions with colleagues.

### **3.4 Management development**

The management development curriculum has a number of fixed trainings, but many training programs are acquired externally based on explicit questions from the organization. The fixed curriculum consists of trainings on basic skills such as conducting development conversations with staff members, and managing and preventing absenteeism. The curriculum aims to cater all levels of management from starting managers to experienced top-level managers. There is also a development program for aspiring managers, focusing a broad set of topics including personal skills, leadership, and organization.

The curriculum includes special trainings that support the aim of CBS to become a learning organization. Besides a training on 'leading learning' for (team) managers, there is also special attention for the learning organization in the training program for new managers.

An important part of CBSA work in the area of management development are custom programs. For example, around 2019, 12 new managers were hired at CBS, and it was decided to organize a single program. The program ultimately started post-covid and was ultimately opened for all team managers. The goal was to integrate the 'new' managers with the organization and to learn from each other by organizing intervision sessions. Furthermore, the program focused on coaching leadership, leadership in the context of a learning organization, and the importance of conveying a shared vision.

Finally, it is noteworthy that CBSA is also involved in organizing annual and quarterly 'management days' that are themed around a current topic. This way, CBSA contributes to continuous development of CBS leadership.

## **4 Towards a Learning Organization**

CBS Academy aims to be the driving force behind CBS moving towards a *learning organization*. The idea of becoming a learning organization is to a large extent a cultural change. CBSA has adopted the following definition of a learning organization.

*A learning organization is an organization that enables its employees to adapt services to a constantly changing environment by encouraging training, development and initiative.*

The main characteristics of a learning organization includes first of all a *safe learning environment*. That is, an environment where employees on every level feel comfortable to ask questions, and to learn new things, including from their mistakes. This leads to an important second aspect, namely *leadership*. CBS leadership should stimulate learning, and exhibit



exemplary behavior by demonstrating their willingness to experiment and make mistakes. On a personal level CBS is looking for employees with a *growth mindset*. That is, people who believe that they are able to grow and develop their skills and capabilities over time. An important aspect of growth mindset is the ability to reflect on oneself and review what is going well and where there is room to learn. The idea of growth mindset extends to the team level. Most work is done in collaboration, and it is important for teams to be able to reflect on their collaboration with team members that are comfortable in providing and receiving feedback (*team learning*). The fifth aspect involves having an *open mind to external developments*. This allows people and teams to learn from trends in other teams and outside the organization. Finally, the sixth and final aspect is a *shared vision*. It is important that staff on all levels has the same idea on what the organization wants to accomplish and how they can contribute to those goals.

CBSA is currently running a four-year program that started off in 2023 with a so-called BUZZ-campaign. The first step of this campaign is to raise awareness around learning organization. The BUZZ campaign is uses several modes of communication, including podcasts, a mini-library at the office entrance, and leaflets and posters at coffee-machines, elevators, and at the lunch tables. Of course there is also communication via traditional channels such as intranet and Slack. The idea is to get the conversations started so CBS staff understands the general principles of a learning organization and why CBS is striving towards it. CBSA also organized events of varying size, including an internal conference on learning organizations, but also so-called 'buzz-dates' that invite staff to meet new coworkers for a short one-on-one conversation.

In the second step (ca 2024-2025) CBSA organizes interventions to stimulate the development of the six aspects mentioned above. The aim is to have the basic organizational infrastructure in place after this part of the campaign. The interventions include education on safe learning environments, an annual CBS-wide 'learning month' a leadership development program with a focus on learning organization and facilitated team interventions. The latter is worth expanding on. To stimulate teams and their managers to work towards a learning culture, CBSA has developed a 'learning compass' game that can be played with a team. The 'game' consists of a number of (possibly customized) cards with challenging questions or statements in several categories that are randomly assigned to pairs of coworkers, who then discuss them for three minutes in front of their peers. Afterwards, there is feedback from the other pairs. Its purpose is to get the conversation started on what being a learning organization means for the team and the people in it.

In the last step (ca 2025-2026) reflection will take place on the activities, where best practices are adopted and a PDCA cycle on learning practices will be put in place to maintain and enhance the learning culture continuously.

## **5 Summary, outlook, and challenges**

In this short paper we have given a short overview of the main strategic challenges that CBS is facing. One of the major current goals of CBS is to be able to quickly respond to external changes. CBS therefor aims become a more flexible organization, and an important aspect of this is to adopt the culture of a learning organization.

We have detailed the history, structure, and modus operandi of the CBS internal training institute: the CBS Academy (CBSA), and its role in the transition towards a learning organization. The CBS Academy is the central educator for all CBS staff, and the driving force behind the cultural change towards a learning organization. It maintains and develops four extensive curricula in the areas of substantive expertise, organizational development, management development and personal development. It also is currently driving a large

campaign, aimed at employees of all levels, to guide CBS towards becoming a learning organization.

There are a number of new and continuing challenges that CBSA is facing. One challenge is the 'learning versus production' issue. Depending on the place in the organization it can be difficult to free up resources for learning. This goes for participating in a training, as well as for becoming an internal trainer or coach. Related to this is that CBSA also occasionally observes that managers have too high expectations of trainings. A two-day substantive training in any topic is not ever sufficient to bring a staff member to proficiency, for example in SQL, R or Python. A training should be considered a push into the right direction and a long-term investment. It is of crucial importance that the newly learned skills can be applied in practice, even if this means temporary decrease in productivity. A third challenge is the integration of the four different curricula into a coherent program. The curricula have in varying extents been developed in isolation. CBSA is currently working to combine courses of the curricula into learning pathways for basic roles in the organization. This will enable CBSA to better advise on trainings and focus its aim to provide competence-based learning interventions.

## **Acknowledgment**

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