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# How to audit a business process excellence implementation?

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## Abstract

Adopting Business Process Excellence (BPEX) practices successfully might appear straight forward, but studies report that few firms achieve the desired objectives. They produce islands of improvements, but fail to sustain the more long term effort and reap the full benefits of their investments. To address the gap, this paper presents a new, integrative BPEX audit method which organizations can use to benchmark their ongoing implementation efforts and results, evaluate progress, and identify specific actions to be done with the aim of developing not only a short term impact, but also long term sustainability of results and improvements.

**Keywords:** *Business Process Excellence, Lean Six Sigma, Audit, Implementation*

## Background and aim

European industry and business as well as public organizations are currently under pressure to improve competitiveness and efficiency due to increased global competition. This has led them to initiate business process excellence (BPEX), i.e. lean-six sigma programs or implementations aiming at achieving specific performance targets but also building capabilities, skills and culture for continuous improvement of business process performance and customer value (Schonberger, 2008).

BPEX primarily has its roots in Lean, TQM, Kaizen and Six Sigma approaches as they have evolved in the automotive industry and with Toyota and other industry leaders after 2nd world war (Schonberger, 2008). However it also exists in a more IT driven version originating from the Computer Integrated Manufacturing (CIM) vision of the 1970-1980s, during the 1990s labeled as Business Process Reengineering (BPR) and Enterprise Resource Planning Systems (ERP) today named Business Process Management (BPM) (Weske, 2007; Hammer and Hershman, 2010).

Adopting BPEX practices successfully might at the outset appear straight forward, but studies report that few companies and organizations actually achieve desired objectives. Companies produce short term gains or islands of improvements, but fail to sustain the more long term effort and reap the full benefits of their investments (Bateman, 2005; Done et al., 2011). Reasons mentioned for lack of success include:

- Implementations fail to recognize that objectives of lean-six sigma initiatives are not to achieve short term results or business turn around in a crisis situation, but more to develop organizational capabilities, skills and a culture enabling continuous improvement of business processes, performance and customer (stakeholder) value.
- Implementations often focus on the most visible elements and practices associated with implementation but fail to deal with the more intangible elements mattering most for long term success (Brunet and New, 2003; Hammer, 2007; Liker, 2004; Liker and Meier, 2007; Liker and Hoseus, 2008). The latter includes e.g.: Having a business process strategy or vision in place to support the initiative, improvement project governance, linking strategy, short term actions and KPIs, leadership, training and management of human resources, team oriented reward systems as well as developing fundamental corporate values and beliefs to support the BPEX journey.
- Most managers are impatient and underestimate the long term journey it takes to succeed with specific improvement projects and develop the desired capabilities, skills and culture for continuous improvement (Done et al., 2011).

To guide organizations on their journey towards excellence, a range of BPEX auditing or benchmarking methods and tools have been developed and proposed over the last decades – they are currently supporting TQM (predecessor of Six Sigma), TPM, JIT and Lean initiatives. Existing frameworks have had widespread application across countries, sectors and companies; we however perceive a need for looking across the current audit approaches which have much in common, but also possess important differences that may not be immediately apparent. The aim is to develop a new, integrative auditing method cutting across different BPEX audit approaches, as well as reflecting latest documented research on practice in European industry, particularly identified reasons for success / failure of BPEX initiatives. Also there is a need for bringing on these methods not only to larger European companies, but also SME businesses which often have a need for guidance of their BPEX decision making and implementations (Bateman, 2005; Done et al., 2010). Aim of this paper is the following:

*To present a Business Process Excellence audit method which organizations can use to benchmark their ongoing implementation efforts and results, evaluate progress on their BPEX journey, and identify specific actions to be done with the aim of developing not only a short term impact, but also long term sustainability of results and improvements*

The paper will include the following parts: Review of selected existing auditing methods, tools and techniques; Presentation of a proposed BPEX auditing methodology currently under development by a team of researchers in collaboration across several European countries (DK, UK, LIT); Plan for pilot testing this methodology on case companies in the manufacturing and service sector; Discussion of results achieved so far and implications for further development of the BPEX audit methodology.

## **Review of Current Auditing Methods**

Numerous best practice auditing / benchmarking methods covering BPEX have been introduced since US and European companies and public organizations began adopting management practices from Japanese Industry in the early 1980s. Several attempts have been made to provide overview of these, their strengths and weaknesses, see e.g. Nightingale and Mize (2002); Alfnes et al (2006) and Jørgensen et al (2007).

This paper makes a quick “deep dive” into 4 of the existing assessment methods: The more than 20 years old European Foundations of Quality Management (EFQM) framework (EFQM, 2011), the American equivalent, i.e. the Malcolm Baldrige Quality Award framework (MBNQA) (Baldrige, 2011) sponsored by the US chamber of commerce, and two, more recent methods - LESAT and PEMM®. LESAT (Lean Assessment Tool) was developed by the Lean Aerospace Initiative – a cooperation between MIT (US) and a consortium of British universities as a lean enterprise transformation framework (LESAT, 2011). The Process and Enterprise Maturity Model (PEMM®) has been developed by management thinker Michael Hammer (Hammer, 2007; PEMM, 2011) based on his experience from reengineering US corporations. Other approaches exist and could be of relevance at this initial stage however, the review here is limited to these 4 approaches and has been conducted comparing the 4 methods on multiple aspects: Origin, definition of BPEX, main BPEX audit dimensions, availability of performance review, number of audit items, guidelines for the auditing process, maturity / excellence levels, preference for internal self-assessment vs. external auditing, recommended industries and sizes, and recommended frequency of audits. From the comparison of these dimensions, some observations can be made and preliminary conclusions drawn:

- The two most applied auditing methods in industry, the MBNQA and EFQM approaches are both more than 20 years old and have been gradually refined and perfected based on several thousands trials and they are still in use today. This in contrast to the more recent LESAT and PEMM® methods which are not as significantly deployed, also their current use in industry is unknown
- Surprisingly, – only the MNBQA audit method comes close to providing a clear definition of BPEX – definitions of the 3 others are relatively vague despite well developed principles, models, assessment criteria etc.
- They all cover a range of BPEX dimensions, reflecting the multi-faceted nature of BPEX and several individual assessment items (26 to around 50), actually recommending that all items are audited and scored to produce the final maturity scoring – 3 out of 4 includes examining if the organization has improved on key measures as part of the BPEX audit
- MBNQA and EFQM methods appear slightly broader and more loosely coupled to specific TQM, Six Sigma, Lean og BPM practices compared to the remaining two audit methods – LESAT has (too) close ties to the “Lean movement” and the PEMM® approach couples closely to BPM – however the latter positively emphasizes IT management as an essential part of BPEX capabilities
- They all operate with either 4 or 5 (maturity) levels of excellence in BPEX
- MBNQA and EFQM are award driven and recommend the use of external assessors, they are the most extensive ones in time and effort required to do the audit, and therefore may be better targeted at larger businesses - this in contrast to the more self-evaluation driven and “lighter” versions which open up for audits being done by the organization itself and thereby more applicable to SMEs

- They tend to recommend a “full scale” BPEX audit approach rather than providing guidelines for tailoring use towards needs of a specific organization
- MBNQA and EFQM audit methods have large organizations behind them running a yearly award process, where the two “lighter” versions do not have this in place, but links to consultants offering related implementation services

The review above demonstrates how MNBQA and EFQM today are available as solid and well developed BPEX audit methods with wide-spread successful practical deployment in European and US industry and the public sector. However it also reveals that the two recent approaches, perhaps less solid but “incumbents”, most likely were established due to a perceived need for alternatives to meet business needs. Also the comparison above emphasizes options for making improvements of current versions across all 4 methods. This has led us to initiate further development / refinement of BPEX audit methods as support to organizations embarking on the BPEX journey.

### **The Proposed BPEX Auditing Method**

Based on the review of existing auditing and assessment tools a number of issues to be addressed in a comprehensive BPEX audit method have been identified. Below requirements formulated by the research team so far have been listed. A BPEX audit method should as much as possible include or possesses the following features:

- A clear definition of Business Process Excellence
- A complete and integrative range of Process Excellence capabilities or dimensions and clearly defined assessment items to be deployed
- A framework for reviewing recently achieved performance improvements
- Specification of main phases / steps of the auditing method
- Visual graphics to display results of audit – “IT-automated” production of these
- Guidance for generating ideas for actions to improve current BPEX efforts
- Ability / flexibility to tailor BPEX audit, it’s content and process to business needs without compromising audit quality
- Applicability across manufacturing and service sectors and business sizes
- A proposed typical audit work plan – proposing relevant sessions and activities
- Self-evaluation of BPEX implementation in a relatively short period of time with sufficiently valid results – so e.g. bi-yearly reviews become an option

Aim of the auditing method is to assist organizations in auditing or benchmarking their ongoing BPEX implementation development efforts, and identify specific actions in support of long term sustainability of results and improvement. The BPEX auditing method is currently in development progress, in this paper a preliminary version of it is presented. During the upcoming year the proposed approach will be refined, tested and enhanced before finally made available for a wider practitioner and academic audience.

### **Definition of Business Process Excellence**

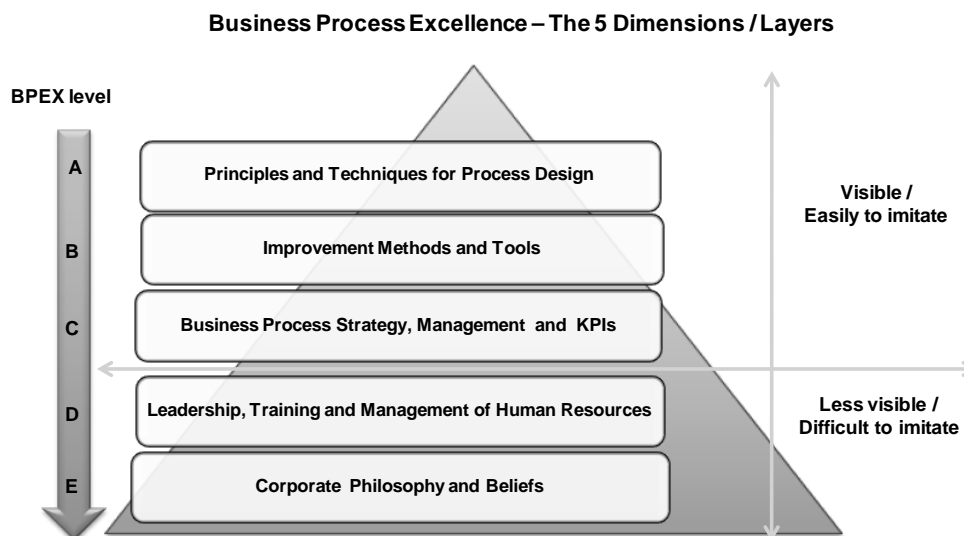
Both academics and practitioners have over decades engaged in discussions on how to define business process excellence. BPEX is established as a multifaceted phenomenon, which poses a challenge to the definition of the concept. We propose the following definition of BPEX:

*Business Process Excellence (BPEX) is a set of organizational practices and capabilities and culture for continuous improvement of business processes, supporting technology and their performance*

The definition is based on a systems perspective on companies, where an organization is perceived as consisting of business process transforming resources (materials, information, energy, human capital) to outputs as products and services to the benefits of clients and stakeholders. Business process performance is measured along multiple dimensions such as customer value, satisfaction, sales, productivity, quality, inventory, lead time, delivery dependability, working environment, and environmental effects. The purpose of BPEX is to simplify, stabilize, standardize and automate business processes to eliminate waste and add value to business clients and stakeholders. The definition above reflects a perception of BPEX as dealing with not only organizational practices or human elements similar to Liker (2004) or Schonberger (2008), but also technological issues including IT / BPM (Weske, 2007; Hammer, 2007).

#### Business Process Excellence dimensions and assessment items

BPEX touch on multiple capabilities, cultural elements and aspects of business processes, supporting IT and their performance. Some BPEX aspects or “layers” are tangible / visible and fairly easy to replicate, others are more intangible / invisible and much more difficult to transfer or copy from one organization to another. We have tried to capture this with the conceptual BPEX pyramid model, shown in Figure 1.



*Figure 1: The BPEX pyramid and its 5 layers or dimensions of Business Process Excellence, sequenced after their visibility to for outsiders of an organization.*

The top layer A of the BPEX pyramid represent essential principles and techniques for business process (re)design – the immediately visible aspects that often are included when an organization offers a guided tour on the shop floor or in the office to demonstrate its BPEX implementation. Typical business process design principles and techniques are 5S, Waste, Takt-time, Flow, Pull, Jidoka, Poka-Yoke, Heijunka, Work Standardization, Process Automation, IT, Visual Management boards and Andons (Liker, 2004; Schonberger, 2008).

Layer B represent BPEX methods and tools generally applied when running specific improvement projects aimed at (re)designing and stabilizing or improving a process and

its performance. A range of process and performance analysis tools are available: SIPOCs, Process and value stream mapping, ABC/ Pareto analysis, Voice of Customer methods, Voice of Process and Control charts (SPC), CpK formulas, 5-Whys, Fishbone diagrams and a range of statistical tools (Liker, 2004; Schonberger, 2008). Improvement methods are typically Kaizen, PDCA, DMAIC project models, change management approaches and A3 communication templates (Liker, 2004; Schonberger, 2008). Use of methods and tools is today widely supported by off-the shelf software packages as Minitab, MS Visio and Excel etc – and require belt training, skills and experience before practical use, but are still fairly easy to copy from one organization to another.

Layer C represents the required management structures to be adapted around the specific improvement projects which continuously are run by a BPEX project organization. A company should formulate a clear Business Process Strategy and link it to specific initiatives on the shop floor / in the office through Policy deployment or Hoshin Kanri methods (Liker, 2004; Liker and Hoseus, 2008). It is advantageous to maintain an overview or map of the Business Process Landscape and IT applications across the organization e.g. using BPM software - and Business Process Ownership must be clearly defined as well as Process Performance should be tracked across the organization (Weske, 2007; Hammer and Hershman, 2010). Not at least should there be in place a continuous prioritization and follow up on ongoing improvement projects and IT investments and their benefit for the business.

Layer D represents management and HR practices – issues which are often lacking focus when organizations implement BPEX. The purpose of this layer is to establish what Liker and Meier (2007) labels the “People value stream” with recruitment and training to ensure continuous build up of BPEX skills and mindsets across the organization and even among business partners. Also appropriate leadership style, intensive coaching of human resources and use of “Go to Gemba” inspired management practices along with systems for team based reward and recognition should be supportive and drive managerial and staff behaviors in an overall BPEX direction (Liker and Hoseus, 2008; Schonberger, 2008).

Layer E represent the final requisite to succeed and sustain BPEX practices and continuous performance improvements long term: The building of a BPEX culture and mindsets across all layers and functions in the organization. BPEX corporate philosophy and beliefs are according to Liker and Hoseus (2008) characterized by a process oriented improvement and innovation mindset, long term thinking, and corporate strategy taking into account the wider societal responsibility of the corporation as well as global sustainability.

#### Assessment of performance improvements

When auditing BPEX, a review of the organization’s BPEX practices and culture is not sufficient, also an assessment of the organization’s ability to turn these into specific measurable performance improvements is required (Schonberger, 2008; Done et al., 2011). A track record of achieved performance improvements on more or less specific measures as client satisfaction, costs, quality, delivery time, dependability during a certain period of time “proofs” if and how well an organization masters BPEX practices rather than just “paying lip service” to fashionable principles. A number of challenges is often faced when reviewing recent performance improvements, these include:

- Quality of data capture and validity of measurements
- Relevance of indicators, e.g. “Client Value” vs “Internal Waste” reduction, “Hard / quantitative” vs “Soft / qualitative” measures

- Aggregation level, e.g. overall profitability vs. business unit KPIs or more operational process measures (PPIs)
- Appropriate time span of the performance measurements, and short vs. long time horizon for reviewing achieved results

Selection and review of BPEX performance improvements should therefore be tailored to what is appropriate and realistically possible to do for the organization or unit / department in scope of a BPEX audit.

#### Scoring of BPEX progress and Maturity

To be able to evaluate or benchmark progress on the BPEX journey of an organization and a selected scope of its business units / departments and processes, we propose to develop a quantitative scoring method. Result of the scoring will be a classification of BPEX maturity on a scale from 1-5. The scoring method in progress operates with the following BPEX maturity levels: **(1) Novice, (2) Advanced Beginner, (3) Professional, (4) Proficient and (5) a World class BPEX organization**. This approach has overlaps with e.g. Jørgensen et al. (2007)'s lean framework proposing 5 levels: (1) Sporadic Production Optimization, (2) Basic Lean implementation and understanding, (3) Strategic lean interventions, (4) Proactive Lean Culture and (5) Lean in the Extended Manufacturing Enterprise. As part of the work, exact definitions and scoring criteria are being defined. The BPEX maturity grading of an organization is to be produced as an aggregate or average of its scoring based on the following sub-aspects:

- Progress of BPEX roll out across the whole organization, from specific processes, across functions / units and towards business partners
- Ability to master layers of the presented BPEX capability and culture pyramid
- Documented short and long term improvements of performance obtained on selected relevant business measures

To score an organization on the 5 BPEX layers, scoring templates are currently being developed for all these aspects and their individual assessment items. The goal is to have a large number of assessment items to pick from when auditing a specific organization. Figure 2 gives an extract of how individual assessment items are broken down into 5 maturity levels. For BPEX layer A, and the single assessment item 5S, the following definition / text, explains the BPEX maturity scoring / grading, see Figure 2.

<b><u>Description of Level A – 5S scoring scale - Example</u></b>
<b>1 - No workplace organization on the shop floor or in administration. All areas are generally disorganized and dirty. It is not clear what is needed and what is not needed</b>
<b>2 - Workplace looks more organized, but it is difficult to determine what is needed and there are few markings to identify proper locations. In general, the cleanliness level is low</b>
<b>3 - Clean, organized work areas. Locations for tools and materials are clearly marked and in their place. Scrap/rework clearly separated</b>
<b>4 - Discipline is high on the shop floor / in administration and 5S principles are applied in the non-production areas (offices, conference/team rooms, etc.)</b>
<b>5 - Formal 5S improvement activities are planned according to improvement targets and audits are performed by management (including plant manager periodically)</b>

*Figure 2: Example on textual explanation for scoring 5S item of the BPEX layer A dimension*



When all BPEX capability and culture layers have been graded, it is possible to produce visual graphics to display either scoring on an individual layer or the final scoring across all layers, see Figure 3 below.

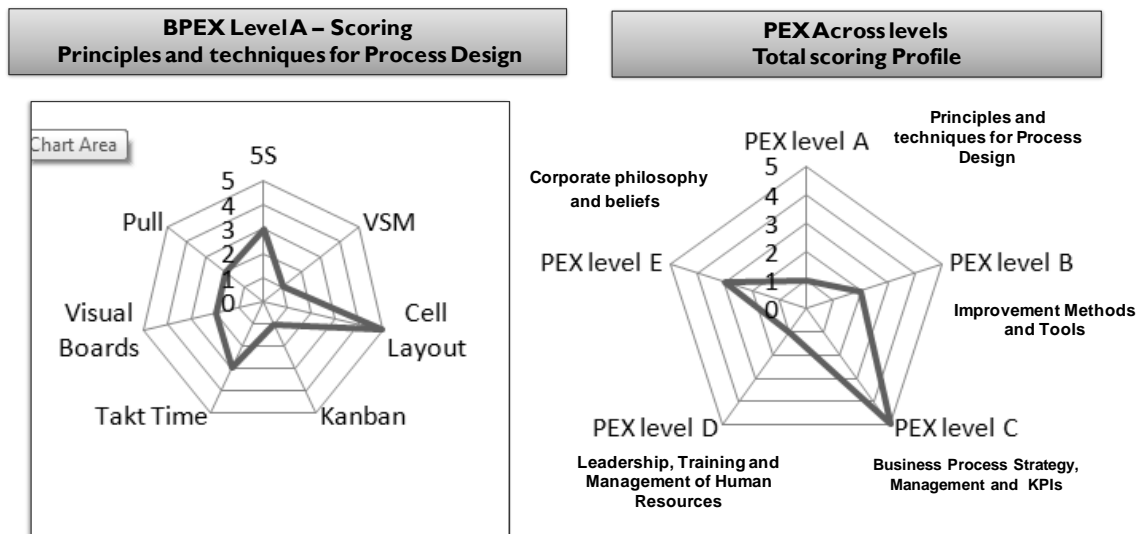


Figure 3: Visual graphics illustrating BPEX scoring within a BPEX capability and culture layer and total scoring across several layers

The overall BPEX Maturity is produced taking into account not only BPEX capability and culture dimension scorings above, but also results of the BPEX performance review and extent of BPEX roll out across the organization. Again results will be displayed graphically to enable a good overview for audit stakeholders.

#### The audit approach and activities

The actual BPEX Audit approach is outlined in a standard assessment 5-step process model, similar to e.g. the EFQM Radar model (EFQM, 2011) with phases explained below in Figure 6. Main activities of the 5 phases are elaborated further in Figure 4.

#### **The BPEX Auditing Method - 5 steps and main activities**

<b>BPEX Audit scoping and preparation</b>	<ul style="list-style-type: none"> <li>• Choice of Business units in focus for BPEX audit</li> <li>• Identification of main stakeholders</li> <li>• Planning of audit activities</li> <li>• Organizing audit work</li> <li>• Preparation of audit</li> </ul>
<b>BPEX Benchmarking analysis and model scoring</b>	<ul style="list-style-type: none"> <li>• Application of BPEX benchmarking model</li> <li>• Scoring along relevant BPEX dimensions</li> <li>• Review of performance improvements on selected measures</li> <li>• Drafting of BPEX Maturity profiles across dimensions</li> <li>• Total scoring and ranking</li> </ul>
<b>Diagnosing BPEX Maturity</b>	<ul style="list-style-type: none"> <li>• Diagnosing overall BPEX maturity</li> <li>• Identification and priority of areas of improvement until next audit</li> </ul>
<b>Generating BPEX improvement actions</b>	<ul style="list-style-type: none"> <li>• Generating proposals for improving BPEX maturity</li> <li>• Evaluating costs, benefits and risks of potential actions</li> <li>• Planning of implementation of actions</li> </ul>
<b>Implementation of actions and results monitoring</b>	<ul style="list-style-type: none"> <li>• Implementation of actions</li> <li>• Ongoing documentation of initiatives</li> <li>• Ongoing tracking of BPEX results</li> </ul>

Figure 4: Proposed PEX Audit approach and main activities per process step

### Organizing, planning and executing an audit

It is our aim that an organization should be able to perform regular self-audits of their progress on the BPEX journey rather than relying on outside experts or consultants to do so, at least after a company auditing team has developed skills in deploying the framework (Nightingale and Mize, 2001). This principle should rarely be violated as organizations typically develop ownership for audit results, through engaging directly in the process, rather than relying on work of outside consultants. It can however at instances, be a benefit to do the auditing in collaboration with an external BPEX expert familiar with the method, similar to when MBNQA and EFQM audits are completed as basis for applying for the yearly quality awards.

At the outset, the research team has concentrated on designing a typical company visit and BPEX Audit process to be carried out by a team of 2-3 researchers together with a chosen team of persons from the business. Despite involvement of researchers, the objective for this week event is still to develop ownership and commitment among company sponsor, managers and staff with the proposed schedule and activities. This as main task of researchers should be to coach and guide the internal BPEX audit team, and next document learnings and results for the research purpose, see figure 5.

**Possible outline of a weekly company visit and BPEX audit of 1-2 Business Units**

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Activities	<ul style="list-style-type: none"><li>•Arrival on location and get in place</li><li>•Session with management team and BPEX and auditing sponsor</li><li>•Introduction of BPEX method to company audit team</li><li>•Training of business team in auditing method, tools and techniques</li><li>•Scoping and detailed plan for auditing of 1 or 2 business units / departments</li></ul>	<ul style="list-style-type: none"><li>•Audit of business unit (s) / department(s)</li><li>•Scoring along all BPEX dimensions</li><li>•Review of recent improvements of selected performance metrics</li></ul>	<ul style="list-style-type: none"><li>•Continued audit is continued</li><li>•Continued scoring along all BPEX dimensions</li><li>•Scoring based on performance measurement review</li><li>•Final scoring of BPEX maturity</li><li>•Drafting of BPEX Maturity profiles</li><li>•Diagnosing BPEX Maturity</li></ul>	<ul style="list-style-type: none"><li>•Presentation of BPEX audit results for management team and sponsor</li><li>•Session on generating improvement proposals</li><li>•Session on evaluation and prioritization of BPEX actions</li><li>•Organizing and Planning of BPEX actions to be implemented</li></ul>	<ul style="list-style-type: none"><li>•Planning how to track changes and results going forward</li><li>•Documentation of benchmarking efforts and results</li><li>•Agreement on next steps with sponsor and company team</li><li>•Closure and farewell</li></ul>

*Figure 5: Draft of possible activities in an audit event lead by a team of researchers and completed in collaboration with sponsor, managers and team of the organization in focus*

### **Pilot testing of the BPEX auditing method**

The obvious research methodology is case based research (Voss et al., 2002), actually a sort of action research (Westbrook, 1995), where researchers as part of development of the BPEX method, engage actively in testing the audit method on “site” by acting as audit trainers and co-facilitators, and capture learnings on strengths and weaknesses when applied in practice. The strategy has a dual purpose of producing powerful observations and scientific insights as well as developing ownership and commitment among participating company stakeholders who can push their BPEX implementation in a beneficial direction.

The first testing of a preliminary version of the audit method is planned for 2 Scandinavian companies – a large bank and a high tech manufacturing company in the electronics equipment industry. Testing is planned for summer and autumn 2011. Based on results of the pilot testing, another round of refinement of the BPEX audit approach and materials is expected, and a final extensive BPEX audit method testing is planned to roll out across 3 countries in Europe (DK, UK and LIT) during 2012 – testing will cut

across different industrial sectors and firm sizes. During the more extensive European testing, an aligned data collection will take place to validate a number of additional research questions / hypothesis formulated regarding BPEX implementations.

## Discussion / conclusion

The paper presented initial results of work completed by a team of European researchers working on developing a methodology for auditing BPEX implementations – initially targeted at businesses and organizations across industry sectors and sizes. The main principles behind the BPEX auditing method in progress were outlined, and extracts of the current preliminary version of the method were introduced and discussed. The BPEX audit methodology is to be developed and tested over the coming 2 years and it is the hope of the research team that it will assist business and public sector managers in bridging the frequently reported gap between the amount of effort (time, money, human resources) often spend on BPEX and the results or improvements they actually obtain – and this through offering them an innovative BPEX audit method offering required business flexibility as well as firm guidelines on how to succeed in practice, so they can do better planning, execution and monitoring off their implementation initiatives.

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