

Canada

Improving project management for small projects

by Claude Y. Laporte, Frédéric Chevalier and Jean-Claude Maurice

A consulting firm, which is also one of Canada's largest engineering companies, has implemented an improvement programme which consists in defining and implementing new management processes for small-scale projects. This company provides a variety of engineering services to industrial and business companies, major institutions and municipalities. It is subdivided into five "divisions" or special business units.

Efficient project monitoring

The programme's objective was to avoid cost overruns and project delays, standardize practices to facilitate the integration of new managers, increase the level of customer satisfaction and reduce risk-related planning deviations.

The new series of standards, ISO/IEC 29110, *Software engineering – Lifecycle profiles for Very Small Entities (VSEs)*, was used to document the company's small- and medium-scaled project management processes, while the ISO Methodology was used to calculate the economic benefits of implementing ISO/IEC 29110.

The project management process improvement programme was targeted at one division of the company, which was created a decade ago and now boasts around 500 employees across 10 offices throughout Canada. As a relatively

The ISO Methodology was also used to calculate the economic benefits of implementing ISO/IEC 29110.

new entity, it had no efficient tools or project management processes suited to managing small-scale projects. The strong growth of the division in recent years made management aware of the need to improve its methods in order to remain competitive. For this reason, most of the projects managed by this division include project plans and cost-time estimates. In most cases, these projects involve updating or improving existing infrastructures. Hence the challenge of handling multiple small-scale, fast-moving projects allowing little room for unwieldy management processes, but still requiring an efficient and straightforward monitoring process.

Managing projects of varying scale

Projects in this division are classified into three categories according to duration,

	Small-scale projects	Medium-scale projects	Large-scale projects
Project duration	Less than 2 months	From 2 to 8 months	Over 8 months
Team size	Up to 4 people	From 4 to 8 people	More than 6 people
Number of engineering disciplines involved	One discipline	One or more disciplines	More than one discipline
Engineering fees	Between CAD 5 000 and 70 000	Between CAD 50 000 and 350 000	Over CAD 350 000

Table 1: Classification of the division's projects (CAD = Canadian dollar).

size, number of disciplines involved and engineering fees. It was decided to subdivide the projects into three categories: small-, medium- and large-scale projects (see **Table 1**).

For this improvement programme, the company developed and implemented project management processes for small- and medium-scale projects.

The goal-problem approach developed by Potter and Sakry¹⁾ was used to set the improvement programme's priorities and to ensure that the goals set by the programme addressed tangible problems that the company wished to solve. This approach includes the following steps:

- Identifying the business goals (see **Table 2**) and the problems that the company wishes to solve
- Grouping goals and problems
- Prioritizing problems
- Developing an action plan

Then, the managers grouped the problems relative to the different goals. Finally, they evaluated the goal priorities and cost for each improvement in order to prioritize goals and establish implementation phases for each one.

Moreover, a risk management plan was developed in order to prevent – i.e., reduce the probability and minimize the impact of – certain events on the project process.

Benchmark selection

There are several documents describing recognized practices for project management, among which guides such as *A Guide to the Project Management Body of Knowledge (PMBOK Guide)* published by the Project Management Institute, maturity models such as the *Capability Maturity Model Integration (CMMI) for Development* of the Software Engineering Institute, and standards such as the new ISO/IEC 29110 series for very small entities.

A meeting with the improvement programme project sponsors helped define a selection of criteria with a view to determining the most suitable project management benchmark for the company. The following criteria were selected:

- The benchmark is suitable for the management of small-scale projects (small team and limited means)

1) Potter, N., Sakry, M., *Making Process Improvement Work*. Addison-Wesley – Pearson Education, 2002.

Identification number	Description
0-1	Facilitate the integration of the new project managers.
0-2	Achieve a global customer satisfaction level of 80 %.
0-3	Meet the deadlines and costs planned for the projects, within a fluctuating margin of 5 % of all projects.
0-4	Reduce resource overload by 10 %.
0-5	As a consequence of poorly managed risks, reduce time delays to one week and cost overruns to 5 % of the initial budget.
0-6	Reduce corrective work during the quality control phase by 10 %.
0-7	Reduce non-chargeable time for resources by 10 %.

Table 2: Division's business goals.

- The company's management knows the benchmark
- The benchmark is recognized by the company's customers
- Tools are available to facilitate the use of the benchmark
- The benchmark may easily be used and integrated into the existing processes
- A recognition mechanism through accreditation for the company is available
- Benchmark documents are readily available

Before analysing the selected benchmarks, each criterion was weighted by its importance according to the project sponsors' perception. ISO/IEC 29110 was the standard selected for the improvement project. Even if the company's division comprises more than 500 employees, a significant number of small-scale projects are carried out by separate teams focusing on one customer only. Since the ISO/IEC 29110 series applies to enterprises,

organizations, departments and projects of up to 25 people, it is perfectly suitable for this company.

Management process

The simplest profile of the ISO/IEC 29110 series – the entry profile – was used as the basis for developing the small-scale project management process. The basic profile was used to develop the medium-scale project management process or for basic project management.

The project management practices used by the company's managers were assessed against the ISO standard's basic profile. **Figure 1** shows the results obtained. It displays the percentage of the tasks performed for each of the following activities of the ISO/IEC 29110 management and engineering guide:

- Project planning (15 tasks)
- Project plan execution (6 tasks)
- Project assessment and control (3 tasks)
- Project closure (2 tasks)

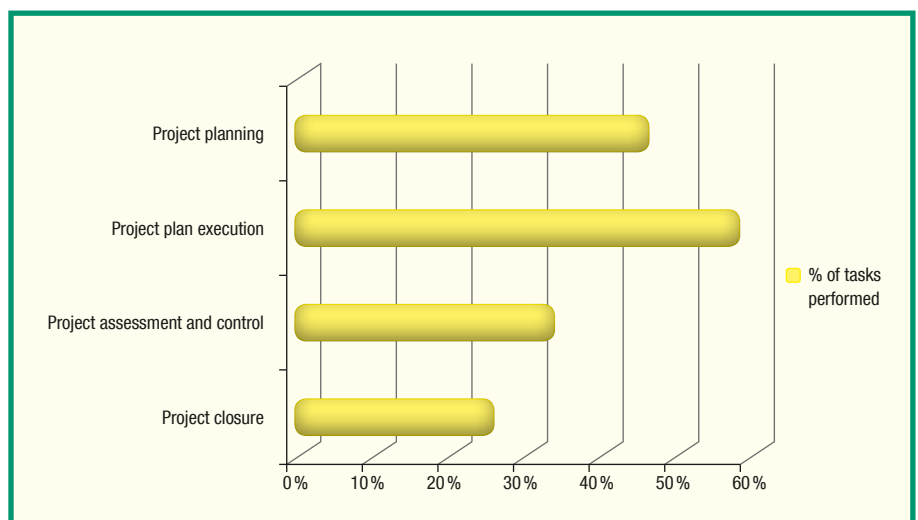


Figure 1: Performance assessment of activities and tasks of the basic profile.

Value driver	Description	Performance indicators	Importance
Quality of the design process	Quality in terms of execution time, costs and quality of deliverables	Time spent on corrective engineering work. Cost overruns related to quality control. Guarantee of the company's long-term viability.	Very important (company viability) [1]*
Efficiency vs costs	Ability to complete the work at minimum cost	Meeting budgets allocated to each sub-project. Meeting overall project budget.	Very important (company viability) [1]*
Project management capacity	Capacity to manage projects according to plans	Cost performance indicator	Very important (completing projects is the company's core activity) [1]*
Technical expertise	Ability to solve complex problems	Schedule performance indicator	Important [2]*
Geographic positioning	Geographic proximity of customers	Resource usage time (additional time)	Average importance [3]*
Partnership	Capacity to initiate partnerships with other companies	Number of partnerships and recurring customers	Average importance [3]*
Flexibility	Capacity to adapt to different customer needs	Number of services provided and type of service compared with competitors	Important [2]*

* [Number] shows the degree of importance and the prioritization of each value driver (1 representing the highest importance).

Table 3: Table of value drivers.

We note that a low level of implementation of ISO/IEC 29110 activities was achieved within the company at the beginning of the improvement programme. Also, during the interview with managers, we noted they were not performed systematically. In addition, the assessment revealed that practices varied from project manager to project manager, and that no guidelines had been defined for some of the tasks. A similar assessment against the entry profile was also carried out.

Development of processes

The development of processes and tools such as checklists and evaluation forms was the central element of the solution to the problems identified. These documents were published on the division's Intranet.

The three project management processes are as follows:

- Small-project management process
- Medium-project management process
- Major-project management process

ISO/IEC 29110 was selected for the improvement project.

Discussions with project managers of the organization revealed that they were often burdened with technical tasks in addition to managing the project. This situation often affected their ability to perform management tasks despite their level of expertise in project

management. It was therefore decided that checklists might provide a useful tool for project managers for the following reasons:

- They are a good way to explain or briefly summarize the tasks to be performed by the project manager
- They help identify quickly the forms and templates available to perform the project management tasks
- They provide quick links to additional references
- They provide guidance to the project manager for storing the project management documents
- They provide an easy means of assessing the implementation of processes

Within the scope of this programme to improve project management practices, the following five checklists were developed:

- Small-project management process
- Medium-project management process
- Major-project management process
- Drafting of service proposals
- Detailed project planning

Pilot projects were carried out to test the solutions thus developed. Checking the solutions in the context of a real-life project helped verify that the proposed solutions were consistent, achievable and comprehensive. It was noted that project managers would appreciate examples of how to implement the tools.

Development of a deployment strategy

Once the final adjustments to the project management processes and tools had been made, a deployment strategy for the solutions was developed, covering the following three aspects:

- Communication aimed at informing project managers in order to dispel any concerns they may have and mitigate the negative impacts that may be generated by unknown situations during a

Functions	Activities	Impact number	Impact	Description	Prioritization [1-high, 3-low]	Performance indicator
Production	All activities	P-1	Better internal information transfer	The use of standardized documents and specifications enables a more efficient internal information transfer.	2	Meeting budgets allocated to each sub-project. Meeting overall project budget. Cost performance indicators.

Table 4: Example of impacts of ISO/IEC 29110.

change programme. Different communication methods were used to inform all employees

- Training of project managers
- Dissemination of accepted solutions to the managers working in the company's various offices throughout Canada. The medium used to circulate the solutions was the corporate Intranet

ISO/IEC 29110 was used to document the company's project management processes.

Support of the ISO Methodology

ISO has developed "The ISO Methodology to assess and communicate the economic benefits of standards"; its key objectives are to provide:

- A set of methods that measure the impact of standards on organizational value creation
- Decision makers with clear and manageable criteria to assess the value associated with using standards
- Guidance on developing studies to assess the benefits of standards within a particular industry sector

The approach used by the company comprises four steps:

- Understanding the company's value chain
- Analysing the value drivers
- Identifying the impacts of standards
- Assessing and consolidating results

After discussion with the members of the company's governance board, the elements shown in **Table 3** were identified as the main value drivers for an engineering consulting firm.

The most significant impacts of the improvement programme on the company were then selected based on the Standards Impact Map of the ISO Methodology. **Table 4** provides an example of such impacts. The link between the impacts of standards used and the performance indicators identified during the previous step are also shown in this table.

An estimate of anticipated costs and benefits over a period of three years was made by the improvement programme project sponsors. **Table 5** shows the results for the first three years.

Description of the management process

The ISO/IEC 29110 management and engineering guide describes a project management process and an implementation process. The purpose of the project management process is to establish and carry out in a systematic way the tasks of the project in order to meet the objectives in the expected quality, time and costs.

During the project planning activity, the project plan is developed. Then, the process assessment and control tasks are used to assess the project's progress against the project plan. Action is then taken, if needed, to eliminate deviations from the project plan or to incorporate changes to the plan. The project closure activity groups together the deliverables produced by the implementation process, such as the software or the user manual, and gets the customer's written acceptance to finalize the project. A physical and digital repository is established to save the work products and to control their versions during the project.

A successful programme

The new ISO/IEC 29110 series enabled the engineering consulting firm to develop project management processes that offered a structured approach to its project managers. The actions required by such processes are restricted to the most essential ones, in order to limit the management effort per project.

The tools developed to support the project management processes proved very useful and helped the project managers rapidly

integrate the knowledge required to execute the processes.

For the first time, the company has documented management processes for small-scale projects. Besides, some project managers have joined forces to promote project management practices within this engineering firm's division.

The improvement programme was so successful that managers of the company's other divisions have shown an interest in learning this approach in order to implement it within their respective divisions. ■

	Year 1	Year 2	Year 3	Total
Implementation and maintenance costs	CAD 59 600	CAD 50 100	CAD 50 100	CAD 159 800
Net gain	CAD 255 500	CAD 265 000	CAD 265 000	CAD 785 500

Table 5: Anticipated costs and gains from the improvement programme (CAD = Canadian dollar).

About the authors

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