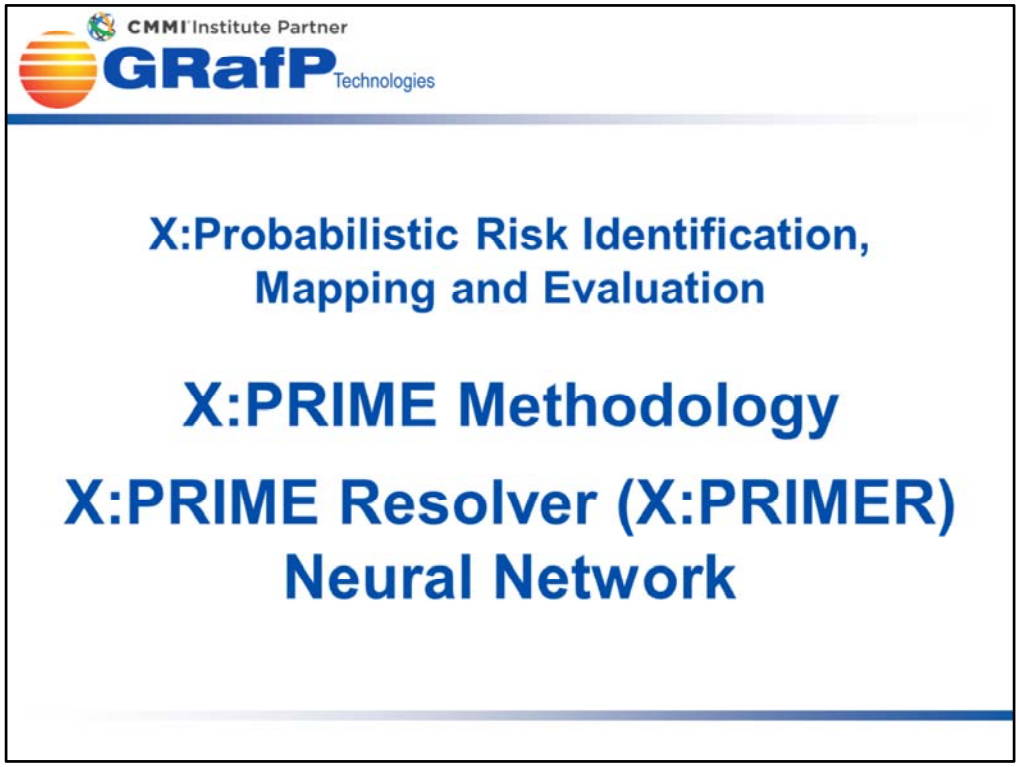
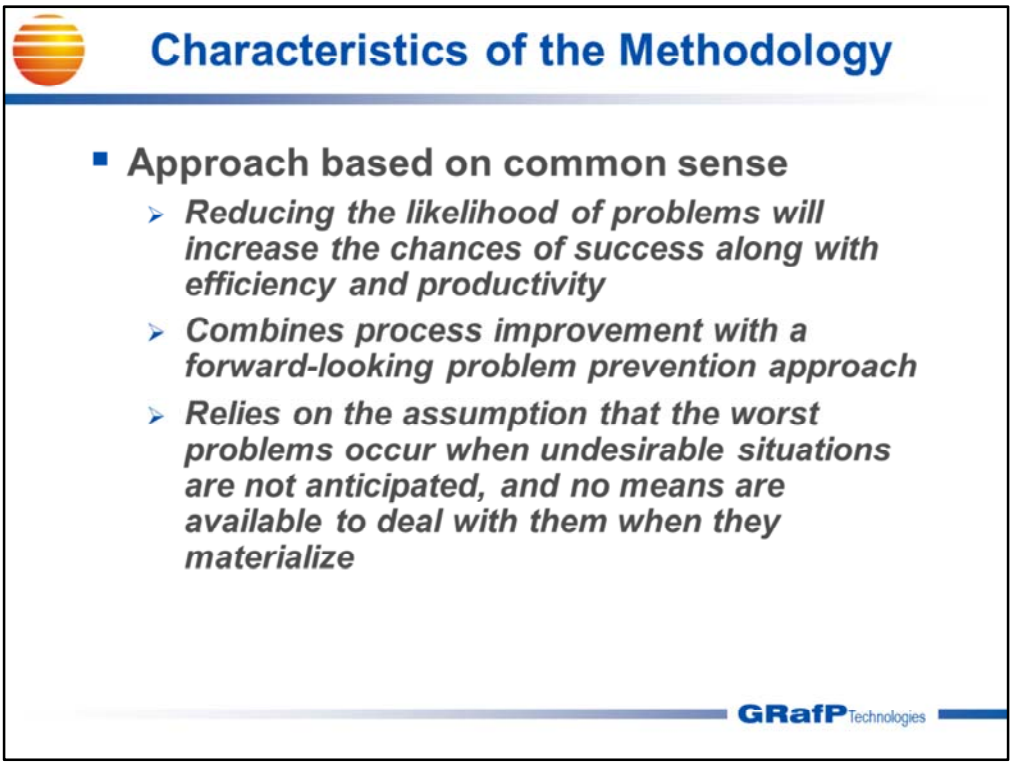


X:PRIME

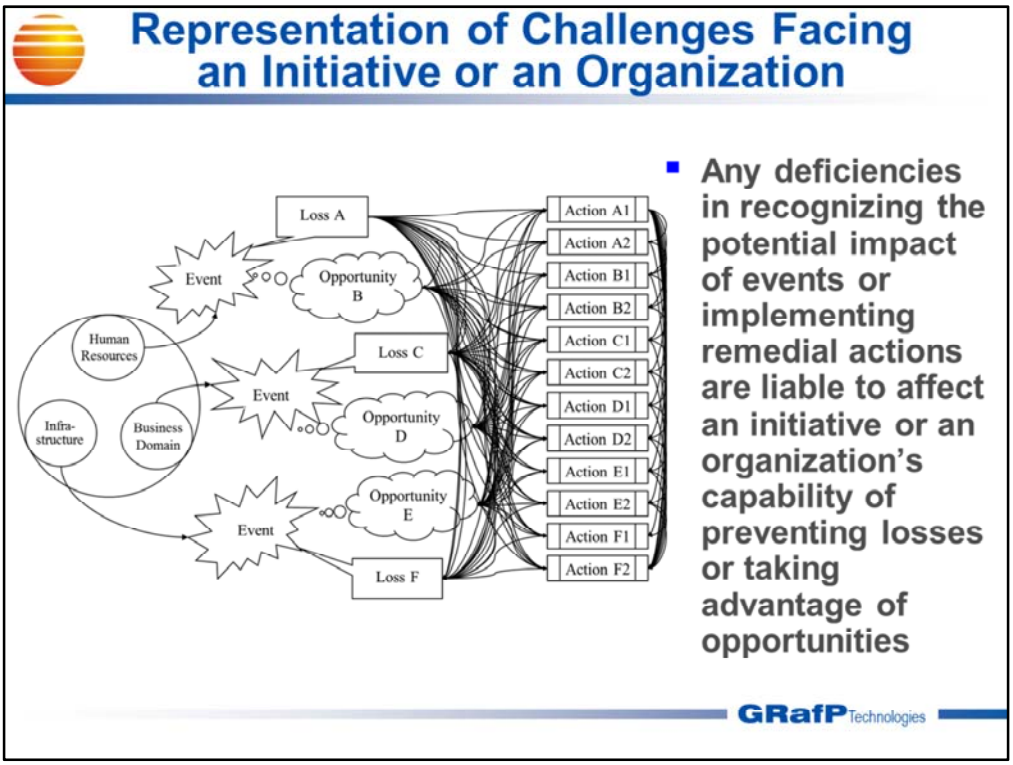
A methodology developed by GRafP Technologies for identifying, mapping and evaluating procedural and operational risks. Based on existing models such as the Taxonomy-Based Risk Identification and the Capability Maturity Model Integration (CMMI®) developed by the U.S. Software Engineering Institute (SEI) and the CMMI Institute, or custom models developed for specific applications, the methodology is designed to meet operational risk management needs of governments and industry.



Characteristics

The most common consequences of ineffective or no risk management are the excessive time spent by managers in dealing with unanticipated difficulties and losses that prevent them from attending to other important issues, the deterioration in public image, the loss of customers, the reduction in forecasted growth and cash flow, and the abandonment of strategically desirable initiatives because of an inherent inability in managing loss exposures, not to mention the frustration of personnel who carry out their activities in an atmosphere of impending disaster.

X:PRIME has been designed to help an entity identify, assess and manage operational issues, that is, the means by which people, procedures, methods, equipment and tools are integrated in order to produce the desired end result. Reducing the frequency of so-called operational problems will increase the chances of delivering on schedule, within budget and with the required functionality.



Challenges

Relationship between root causes, events that translate into potential losses and gains, and actions that can be taken or avoided to take advantage of a possible gain or to prevent a potential loss. For example, assume …

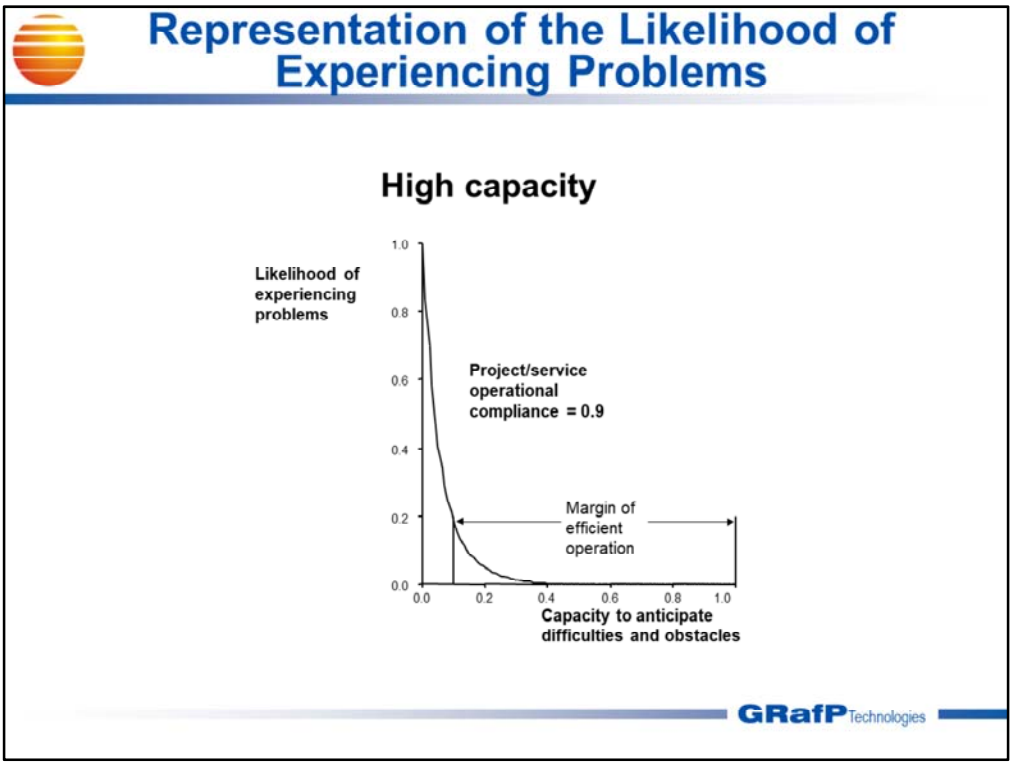
Each root cause translated into 10 events liable to result in either a loss or a gain: 5 options available to reduce a loss resulting from a given event; and 5 options available to take advantage of the opportunity created by a given event, which translates into …

3 root causes x (10 losses + 10 gains) = 60 possible outcomes

3 root causes x 5 options x (10 losses + 10 gains) = 300 possible actions

Therefore, the number of interactions to examine after the occurrence of a given event = Number of pairs among 360 = 360!/(2!358!) = 64,620

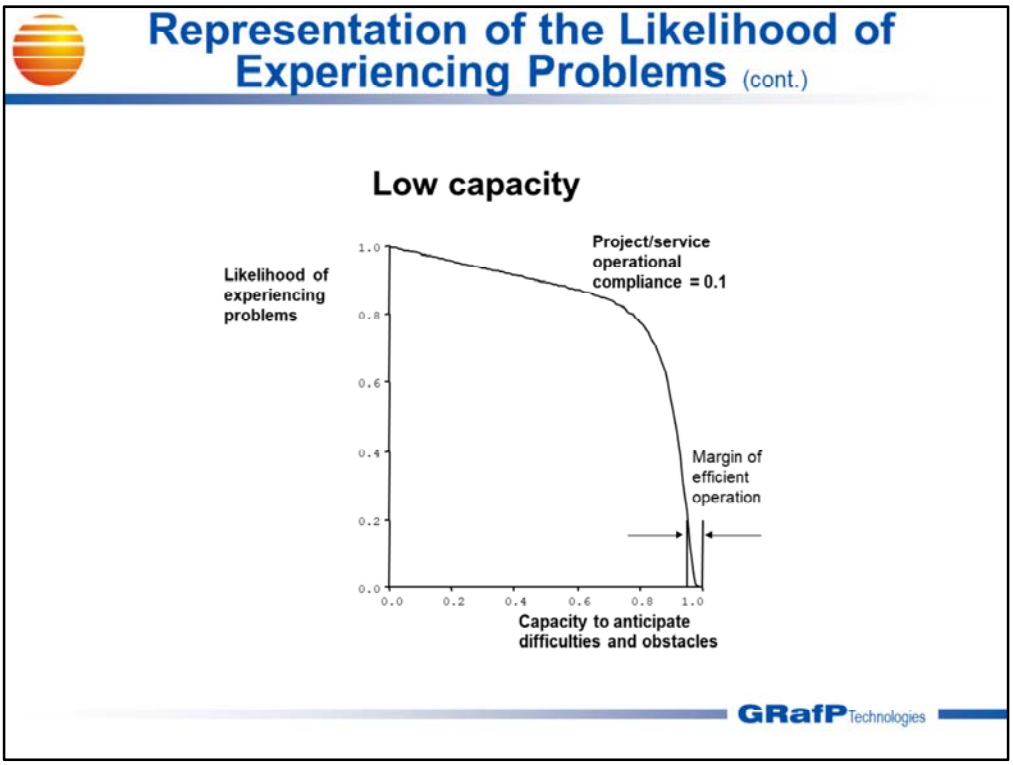
Imagine that one is driving a car, and this scenario occurs. It implies that the driver examines 64,620 interactions to pick the most suitable, possibly in a very short time.



Likelihood of experiencing problems with a high capacity

For an entity characterized by a high capacity, the margin of efficient operation is wide. However, this status does not necessarily ensure success. If the established operational capacity is ill-adapted to the business domain or do not allow managers to perceive adequately the risks to which the entity is exposed, problems are bound to develop sooner or later. However, even a modest improvement in such an entity is likely to result in an exponential decrease in the likelihood of experiencing problems.

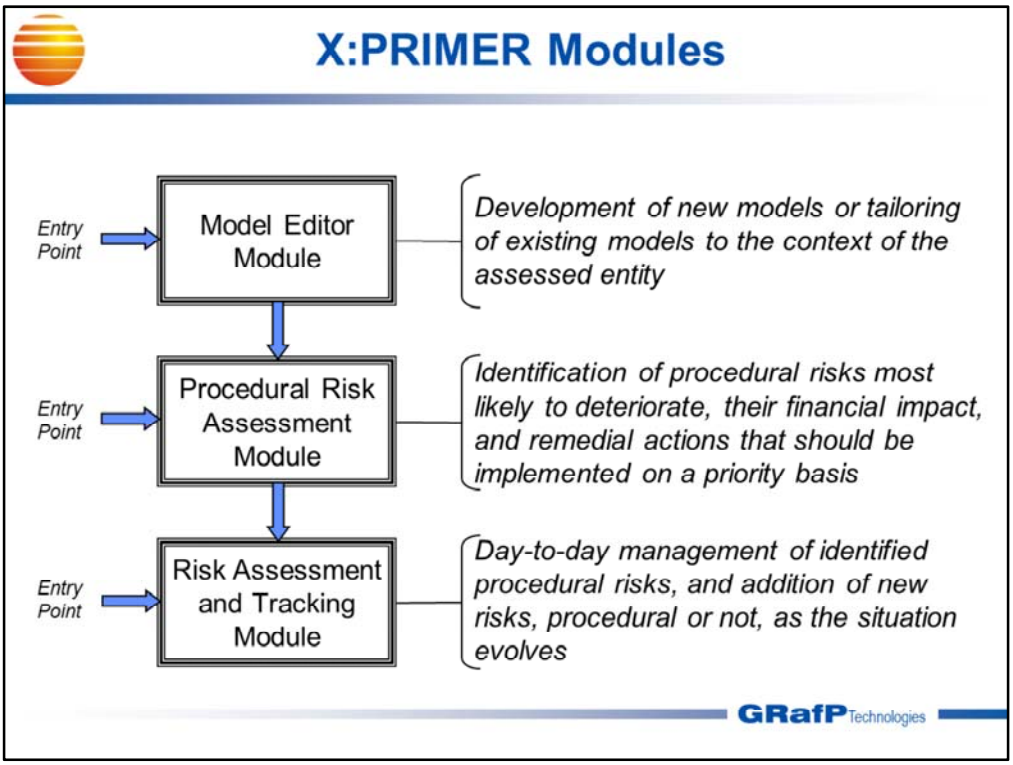
The establishment of a high capacity will require a significant investment and is likely to result in a higher overhead for the entity. On the other hand, a higher capacity will allow the entity to diversify and to undertake more complex and/or larger initiatives with better chances of success.



Likelihood of experiencing problems with a low capacity

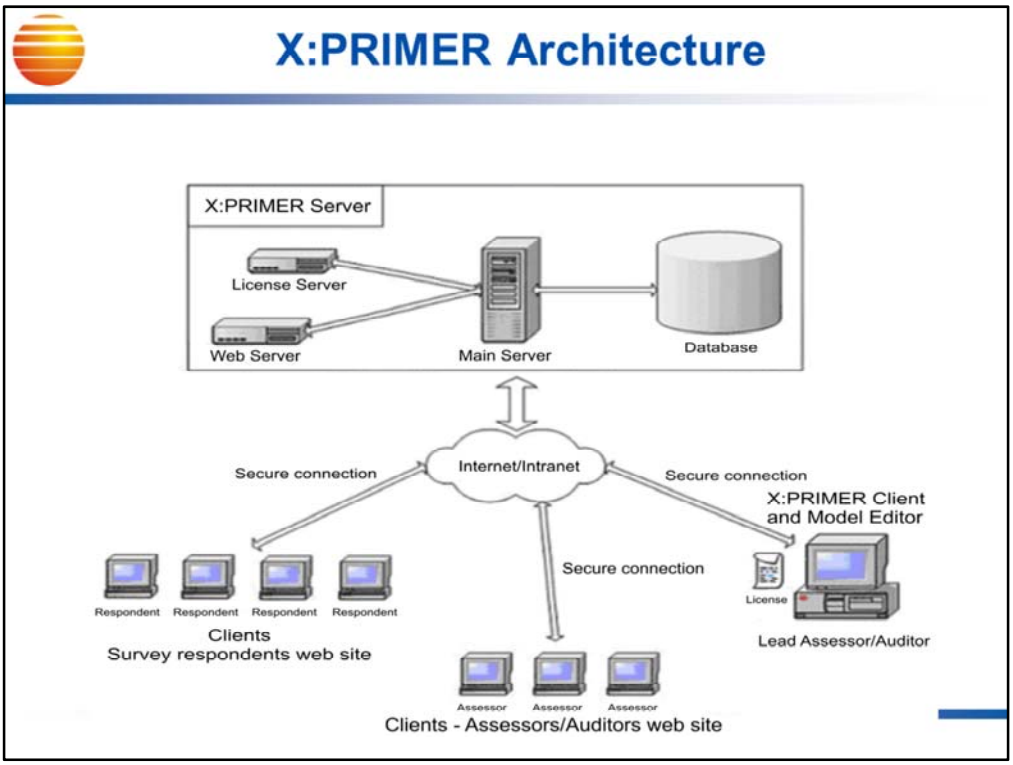
For an entity characterized by a low capacity, the margin of efficient operation is narrow. However, such an entity can still be very successful if the established operational capacity is well adapted to its business domain and allow managers to develop a good perception of the risks to which the entity is exposed. However, should the business domain change for one reason or another, and the likelihood of experiencing problems will increase exponentially.

The theory behind X:PRIME postulates that there exists at least one course of action that will make an initiative or an organization operate at an arbitrarily low likelihood of experiencing problems, thereby maximizing the odds of fulfilling its business objectives, as long as this course of action does not exceed the initiative's or the organization's inherent capacity to implement it.



The X:PRIMER solution consists of three main modules:

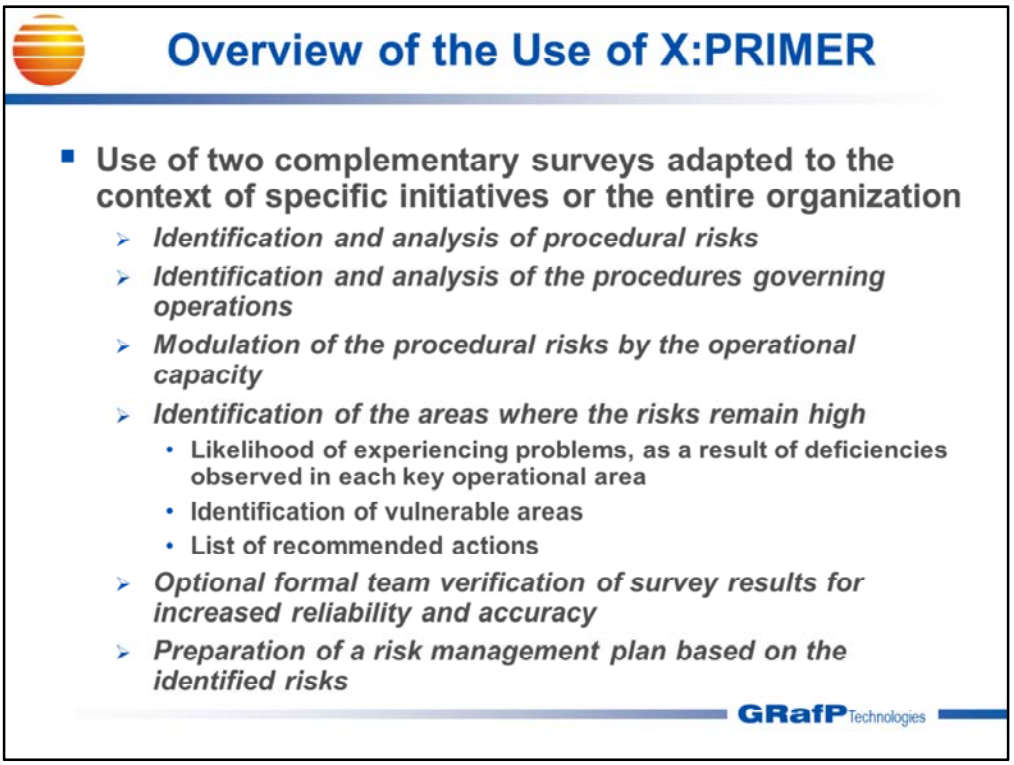
1. The Model Editor allows developing models applicable to the context of the entity being assessed. The resulting models are used by the Operational Risk Assessment module to carry out the assessment.
2. The Operational Risk Assessment module allows identification of operational risks and of remedial actions that should be implemented to reduce the likelihood or impact of those risks. The resulting risks, along with the recommended remedial actions, can be exported to the Risk Assessment and Tracking module so that they can be tracked and managed.
3. The Risk Assessment and Tracking module is used to track and manage identified risks and remedial actions. New risks, operational or other types of risk, can be added and their financial impact assessed as applicable.



Architecture

Relying on a Web-based client-server architecture and neural networks, X:PRIMER provides a control panel that supports data acquisition, information exchange, and which interfaces with an organization's management information system. It is therefore possible to acquire an appropriate visibility over the development, acquisition and service centers of an organization worldwide. X:PRIMER embedded algorithms support the execution of internal assessments, in which users are inherently biased, as well as evaluations and audits performed by external, unbiased assessors.

With the results generated by X:PRIMER, an organization can establish its own risk repository and acquire a precise understanding of its operations, an essential component of the corporate knowledge base that will constitute the success factor of the enterprises and organizations of the XXIst century.

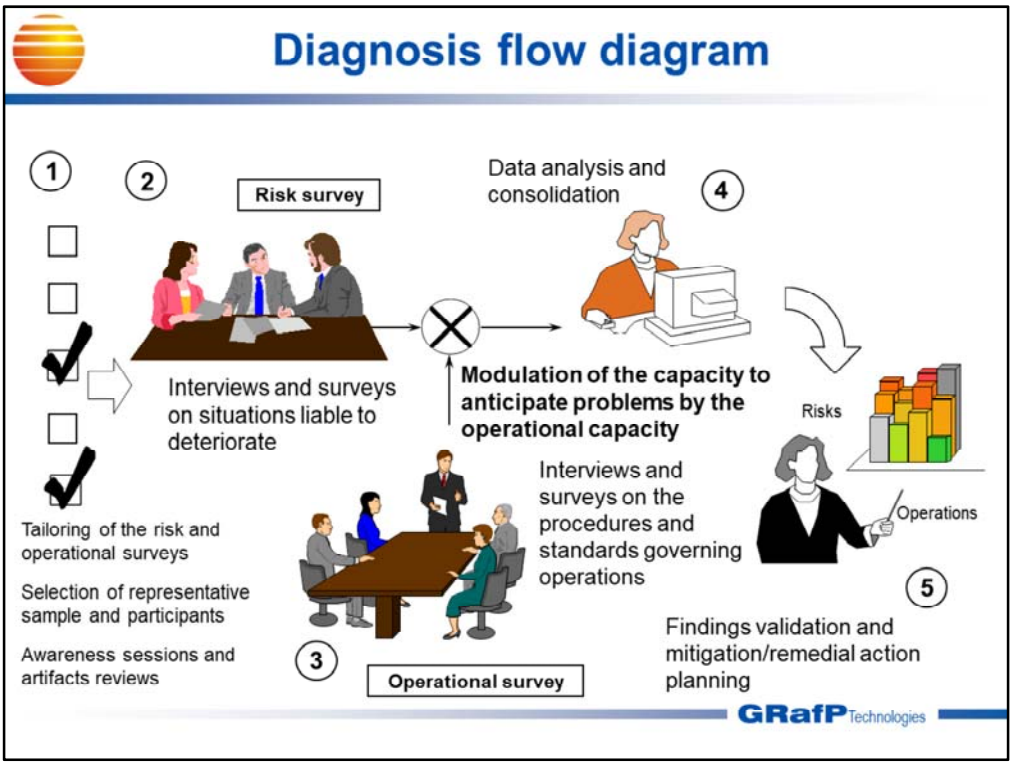


Overview

X:PRIMER relies on the use of two different surveys targeting two complementary groups of participants. Generic versions of these surveys are used as a starting point and are tailored to the needs of the assessed entity.

The purpose of the first survey, referred to as the risk survey, is to identify the perception that personnel has of the level of incurred risk in the areas for which they are responsible, for each of pre-defined categories of risks defined in the method derived from the X:PRIME methodology.

The second survey, referred to as the operational survey, is addressed to practitioners within the assessed entity and seeks to determine its operational capacity against key operational areas. The operational capacity, assessed with the help of the operational survey, is then used to modulate personnel's risk perception level, assessed with the help of the risk survey.



Flow of activities

a. Tailoring of a generic survey designed to measure the level of risk perceived by personnel to the needs of the assessed entity (step 1).

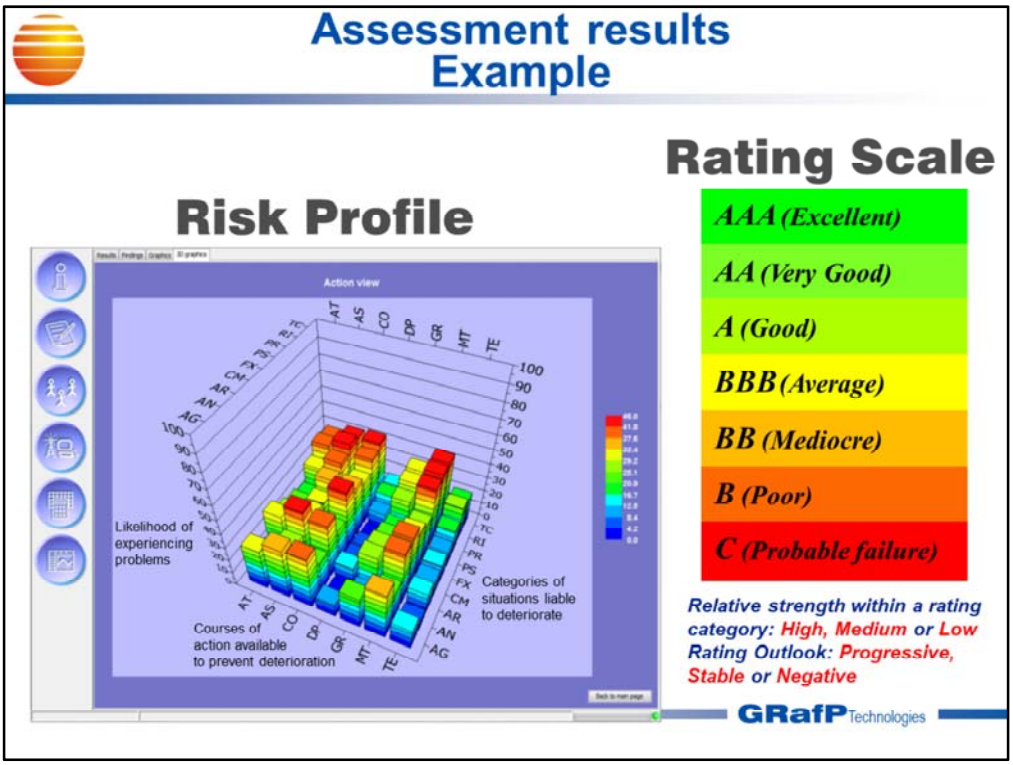
b. Tailoring of a generic survey designed to measure the current operational capacity to the needs of the assessed entity (step 1).

c. Selection of an sample representative of the assessed entity's activities (step 1).

d. Interviews, documentation reviews and surveys involving the managers of the selected sample and the practitioners performing or supervising execution of the work (steps 2 and 3).

e. Analysis and consolidation of the collected information (step 4).

f. Validation of results, compiled in graphic form, and planning of the subsequent steps required to mitigate identified risks (step 5).

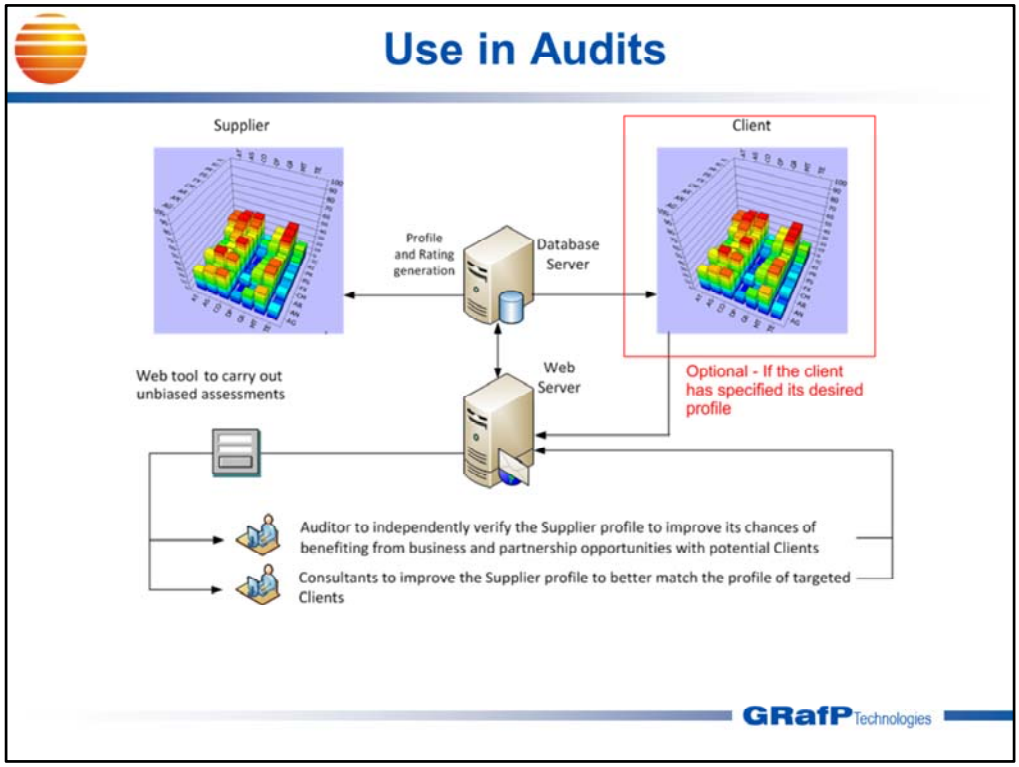


X:PRIME results

The X: Probabilistic Risk Identification, Mapping and Evaluation Resolver (X:PRIMER) is a client-server, web-based tool supporting the X:PRIME assessment methodology. It generates a risk profile by plotting the likelihood of experiencing problems (referred to as probable risk) for each risk category and each key operational area. The highest peaks are identified, then the risks facing the assessed entity are extracted, along with the existing key operations to improve or the new ones to introduce in order to reduce these risks. Participants comments recorded with the help of the surveys are used to tailor and/or to elaborate on these risks and operations.

A scale similar to the one used in finance is applied to generate a rating.

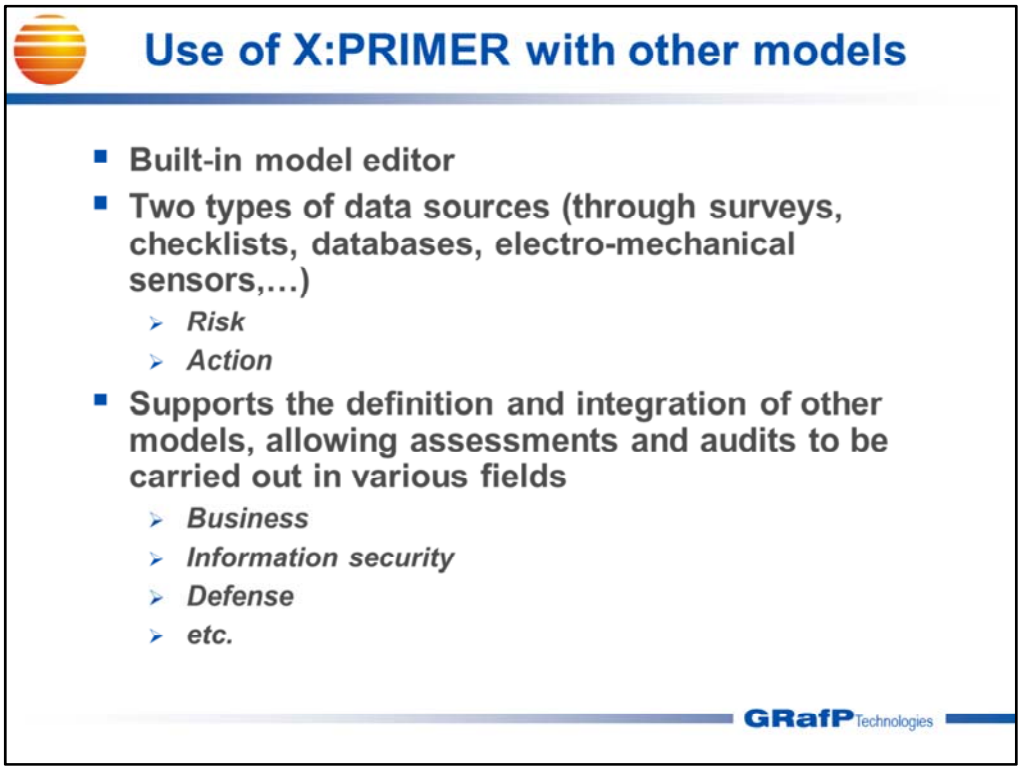
X:PRIMER also supports the verification of an assessment results by a team of auditors who collect evidence and refine the assessment results.



Audit Support

The premise on which X:PRIMER is based is also applicable to audits.

If one implements sound controls and appropriate remedial actions in response to non-compliances against desirable operations (in the form of standards, guidelines, specifications or others) and compliances with undesirable operations (e.g. actions to avoid), then the risks an initiative or an organization one faces will be reduced, and if the risks are reduced, then there will be fewer problems; if there are fewer problems, then the chances of success will be increased.

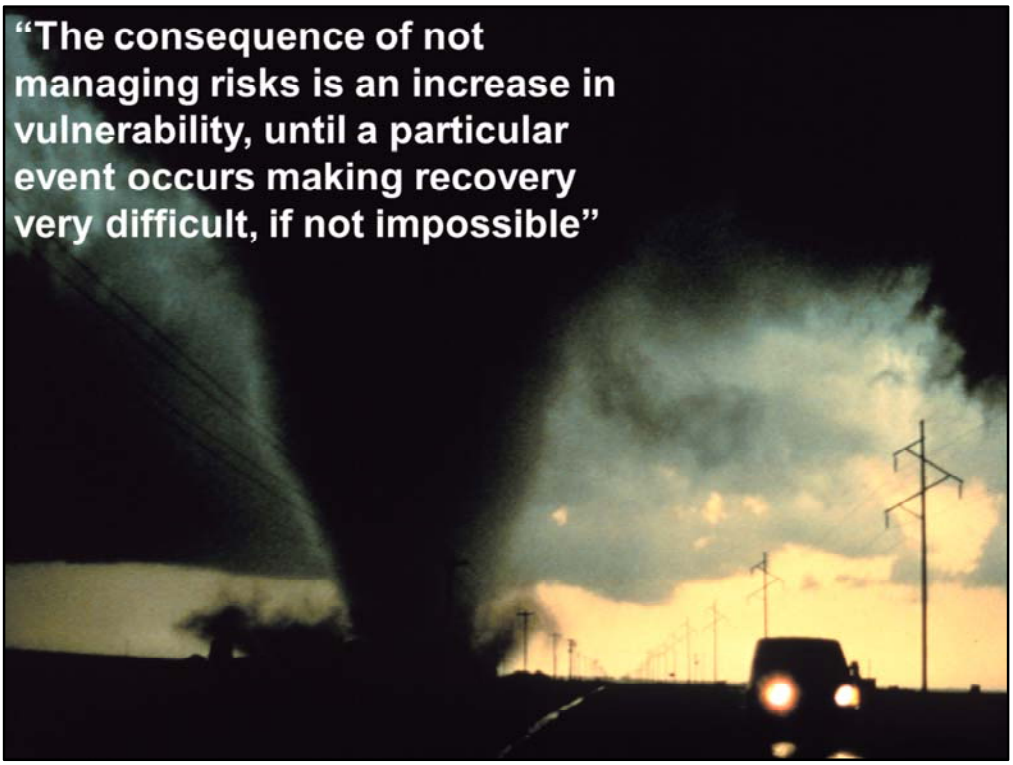


Integration of other models

X:PRIMER allows an organization to model and optimize its operations. The application, through its data acquisition, reduction and analysis functionality, lends itself to simulations and the use of models specifically developed for the assessed entity's expressly stated needs. Sanitized assessment results can also be exported into a database in order to perform trend analyses and benchmarking.

X:PRIMER includes a model editor that allows the creation of new models from scratch and methods tailored to the needs of specific business domains. The model editor essentially makes it an easy task to specify how a given entity should operate, such that its actual performance can be assessed to minimize mishaps and maximize efficiency.

Ultimately, electromechanical sensors can be interfaced to the application such that physical systems can be monitored and controlled.



Conclusion

Managing risks, in any field, can be a daunting task unless it is supported by appropriate methods and tools. Given the large number of interactions that can lead to failure, statements such as the one made by Napoleon Bonaparte, to the effect that all he wanted from his generals is that they be lucky, are not entirely surprising.

The need to manage operational risk can be summarized by the statement made by Andrew Grove in his book ‘Only the paranoid survive’, in which he sums up his tenure as CEO of Intel Corporation: ‘Sooner or later, something fundamental in your business will change’.