ошибку, потому что папка с указанным именем уже создана, а `makedirs` способна создавать бесконечную вложенную структуру:

```
[In:1] import os
[In:2] os.mkdir("папка")
[In:3] os.makedirs("папка")
```

Перемещение файла или папки осуществляется функцией `os.replace`, для переименования файла или папки используется функция `os.rename` более того, файл с новым именем может располагаться в другой папке.

Функция `os.listdir` выводит список файлов и директорий в указанной папке:

```
[In:2] print(os.listdir(path))
[Out:2] ['файл.txt', 'snd_dir', 'проект.py', 'fst_dir']
```

Для осуществления удаления папки или целого каталога используются две функции - `os.rmdir` и `os.removedirs`. Первая функция `rmdir` удаляет указанный пользователем каталог, но в том случае, если указанный каталог не содержит файлов, то есть, если каталог пустой. Вторая функция `removedirs` удаляет всю цепочку вложенных каталогов. Пользователю стоит быть очень внимательным используя приведенные выше функции удаления, чтобы случайно не задеть нужные каталоги.

Метод `os.startfile` позволяет запускать файлы и папки напрямую из программы. Осуществляется это следующим образом:

```
[In:1] import os
[In:2] os.startfile(r"D:\test.txt")
```

Метод `walk`, можно получить доступ к названиям и путям всех подпапок и файлов, относящихся к заданному каталогу:

```
[In:1] import os
[In:2] for root, directories, files in os.walk(r"D:\1PMI(3)"):
[In:3]     print(root)
[In:4]     for directory in directories:
[In:5]         print(directory)
[In:6]     for file in files:
[In:7]         print(file)
```

В статье были приведены и рассмотрены базовые функции модуля `os` языка Python. За счет множества методов по управлению операционной системой модуль `os` предоставляет не только возможность получать сведения о платформе и ее прилегающих файлах, но и работать с этими же файлами, хранящиеся в дисках, создавать новые файлы и директории, переименовывать и удалять их.

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MFS Risk Monitoring

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Abstract

Everything we do while managing a software development project should be aimed at dealing with the risks of not meeting deadlines, overspending resources, developing the wrong product that is required.

The objectives of project risk management are to reduce the likelihood of occurrence and / or the significance of the impact of adverse events for the project.

Keyword: risks, software, project, analysis and planning, IT project.

Аннотация

Все, что мы делаем, управляя проектом разработки ПО, должно быть направлено на борьбу с рисками не уложиться в срок, перерасходовать ресурсы, разработать не тот продукт, который требуется.

Цели управления рисками проекта — снижение вероятности возникновения и/или значимости воздействия неблагоприятных для проекта событий.

Ключевые слова: риски, программное обеспечение, проект, анализ и планирование, ИТ-проект.

Risks are factors and events that can have a negative impact on the project in the future. MSF has a dedicated process to help identify, track and minimize risks.

Risk identification is the first step in MSF's risk management process [1]. In order for the project team to start analyzing and planning them, it is necessary to initially identify and clearly and unambiguously formulate the existing risks. When identifying risks, the project team should pay attention to the widest possible range of factors. In particular, research should be carried out and the identification of unaccounted for features of the project and the environment in which it will be developed, since they can significantly affect the project or even cause its failure.

A typical MSF risk management model includes six steps [2].

1. Risk Identification. It is important to identify the risks of an IT project in a timely manner, preferably at the initial phases of the life cycle, to establish the sources (people, processes, technologies and external conditions for the implementation of the project), the conditions for the occurrence of risks. The experience of the project team members, the classification of risks, corporate rules and guidelines for countering risks, and the knowledge base on the risks of IT projects are of great importance.
2. Risk Analysis. Risks receive priorities (Risk Prioritization), subdivided into major and insignificant. Each major risk is quantified: the probability of risk occurrence (Probability), the amount of damage (Impact) or additional benefit (Profit), the expected amount of risk (Exposure).
3. Risk Planning. A detailed plan for managing the main risks of an IT project contains the following strategies.
 - Research — information about the risk and its consequences is clearly not enough to make a decision, further research is required.
 - Accept — the expected value of the risk is considered as inevitable losses.
 - Avoid — taking actions to avoid the emergence of risk.
 - Transfer of risk to another project, project team, organization or individual.
 - Risk prevention through measures to eliminate risk conditions.
 - Mitigation of consequences - measures are developed that will reduce the negative consequences of risks.

A detailed action plan for the risks of an IT project - Risk Scheduling - ensures the implementation of the strategies developed to ensure the continuity of risk management.

4. Risk Tracking. Monitoring the implementation of plans to prevent risks of an IT project, informing the project team about response plans in case of risks, monitoring their implementation.
5. Risk Control. Due to the onset of risks, changes are made to the IT project (Project Change Control Requests).

6. Risk Learning. Assimilation of accumulated experience, formation of a knowledge base about risks, achievement of maturity in risk knowledge management.

A schematic of the risk management process for MSF looks like the one shown in Fig. 1.

Figure 1. Risk management

Risk monitoring and management is the process of identifying, analyzing and planning responses to new risks, tracking previously identified risks, and reviewing and executing risk response operations and evaluating the effectiveness of these operations.

Risk monitoring and management uses a variety of techniques, such as trend and variance analysis, which require quantitative performance data collected during project execution. Monitoring and risk management includes the following tasks:

- redefining risks;
- risk audit;
- analysis of deviations and trends.

Risk reviews should be carried out regularly, according to a schedule. Project risk management should be one of the agenda items for all project team meetings. Identification of new risks, and revision of known risks, takes place using the processes described earlier.

Risk audit involves the study and presentation in documentary form of the results of assessing the effectiveness of measures to respond to risks related to identified risks, the study of the main causes of their occurrence, as well as an assessment of the effectiveness of the risk management process.

Trends in the course of project execution are validated using execution data. Earned value analysis and other methods of analyzing project variances and trends can be used to monitor the progress of the entire project [3].

Based on the outputs of these analyzes, potential project variances at the time of completion can be predicted in terms of cost and schedule. Deviations from the baseline can indicate impacts from both threats and opportunities.

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