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CRITICAL SUCCESS FACTORS IN MANAGING BIOMETRIC AUTHENTICATION SYSTEMS IMPLEMENTATION PROJECTS

Summary. This paper addresses the problem of managing the projects related to implementation of biometric authentication systems. In the first part of the paper biometric authentication systems were briefly described. The second part of the paper depicts the implementation process of those systems and the third part of the paper is about critical factors responsible for successful management of implementation projects of biometric authentication systems.

Keywords: biometric authentication, project management.

KRYTYCZNE CZYNNIKI SUKCESU W ZARZĄDZANIU PROJEKTAMI IMPLEMENTACJI BIOMETRYCZNYCH SYSTEMÓW UWIERZYTELNIAJĄCYCH

Streszczenie. Artykuł został poświęcony zagadnieniu zarządzania projektami związanymi z implementacją biometrycznych systemów uwierzytelniających. W pierwszej części artykułu krótko scharakteryzowano istotę biometrycznych systemów uwierzytelniających. W drugiej części przybliżono proces implementacji tych systemów, a trzecia część dotyczy krytycznych czynników odpowiedzialnych za sukces w zarządzaniu projektami implementacyjnymi biometrycznych systemów uwierzytelniających.

Słowa kluczowe: uwierzytelnianie biometryczne, zarządzanie projektami.

1. Introduction

Project management is nowadays an extremely interesting subject in the field of education, research and development. Many organizations decided to move from traditional,

functional structure to project-based structure, with project team and a project manager. Project-based organizations are flexible and prepared for dealing with projects which are complex and unique [8]. We shall start the literature review with the paper written by Roger Atkinson in 1999 [2], according to which, the Iron Triangle (cost, time and quality) is inextricably linked with success of project management. The author presents “The Square Route” with success criteria divided into four groups: Iron Triangle, the information system, benefits from organization point of view and benefits from stakeholder community point of view. Duncan Haughey [5] presents four levels of project success which forms the project management maturity matrix. Level 1 entitled „Project Management Success” is related to cost, time and quality and satisfies the question about the desired output of the project. Level 2, called „Repeatable Success” is related with the question about producing the desired outputs in a repeated way. Level 3 or „Project success” maps the project outputs to desired outcomes. The last level, „Corporate success” verifies whether the outcomes have intended impact on business strategy. An interesting view on success factors can be formulated looking from the complementary and opposite to success perspective, i.e. the reasons causing the project management *not* to succeed.

Tim Bryce in his work [3] inquire into the reasons why project management fails. We could not agree more to the introductory Bryce’ Law, according to which project management is *not* just a set of tools and techniques and it is as effective as the people who are using it. It could be summarized that there are four indicators of failure in project management: lack of knowledge, lack of formal policy for project management, lack of enforcement of policy and procedures and finally, the lack of consideration for complexities of project management. As the main focus of this article is related with modern, sophisticated IT-related security solution (here: biometric authentication system), it would be useful to lower the level of abstraction of the considerations and move to IT-related project management, of course keeping in the spotlight the factors influencing the success of project management.

Dr Joseph Gulla in 2012 [4] formulated 7 reasons why IT projects fail: (1) poor project planning and direction, (2) insufficient communication, (3) ineffective management, (4) failure to align with constituents and stakeholders, (5) ineffective involvement of executive management, (6) lack of soft skills or the ability to adapt and (7) poor or missing methodology and tools. The same author constructed in 2011 Five Factor Model (Project Management, People, Business, Technical and Methods).

Finally, it should be emphasized, that current and extensive literature review in the field of success factors in project management, have been prepared by prof. Seweryn Spalek and published in 2014 [9].

The main goal of the paper is to present the idea of biometric authentication systems, describe the process of implementation of those systems and finally, show the identified critical success factors in managing biometric authentication systems implementation projects.

The article has been divided into three parts with introduction at the beginning and summary at the end. The first part is about biometric authentication systems (further: BAS), the second part is about the implementation process of BAS and the third part is about critical success factors in project management of implementation BAS.

2. Biometric authentication systems (BAS)

In the scientific and technical literature there are highlighted four main types of authentication methods [1, 6, 7]: the authentication methods based on the knowledge, the methods based on the physical identifiers and the authentication methods based on biological or behavioral characteristics. For the purpose of this paper we shall focus on biometric authentication, which relies on physiological traits of human body. The biometric authentication systems operate in two phases: enrollment and verification [1].

During the first phase raw biometric data is firstly preprocessed, later transformed into set of features and finally stored with user identifier in biometric template database. The verification phase is aimed at answering the question whether the authentication data provided by the user is positively or negatively verified against data stored in biometric template database created during the enrollment phase. In the second phase, the authentication data consists of raw biometric data and user identifier which is used during the comparison – the corresponding to user identifier reference template is selected from biometric template database and compared with the result of extracted feature set created from current raw biometric data, i.e. the biometric data provided by the user during the verification phase.

The biometric authentication system has been presented on fig. 1.

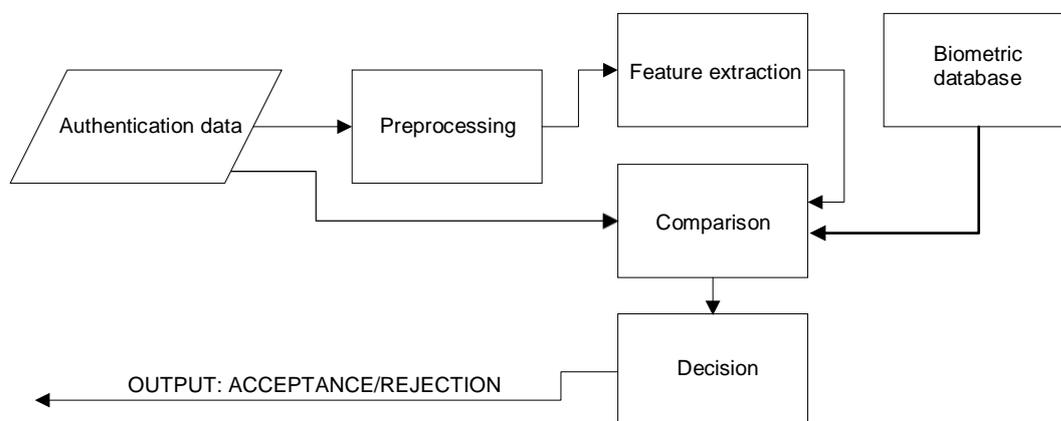


Fig. 1. Biometric authentication system

Rys. 1. Biometryczny system uwierzytelniający

Source: Author's own based on [10].

3. The process of BAS implementation

The biometric authentication system implementation process usually consists of the following steps:

- Preparing the specification of implementation process,
- Preparation for installation at the client side (e.g. preparing the user workstations),
- Installation of the software components needed to operate the biometric layer at the client side (biometric reader internal software, biometric system client software and biometric authentication provider),
- Installation of the hardware components needed to operate biometric reader at the client side (biometric reader),
- Preparation for installation at the server side (preparing the authentication server),
- Installation of the software components: biometric system server and biometric authentication provider at server side,
- Testing the process of biometric enrollment,
- Testing the process of biometric verification,
- Documenting the implementation process.

Presented implementation process is focused on technical (operational) point of view and basing on gathered experience, performing the steps mentioned above not always led to successful conclusion of the project.

4. Critical success factors in project management of BAS implementation

The critical success factors in project management of biometric authentication systems were prepared based on experience obtained during implementation of 30 biometric authentication systems in different organizations in Poland, which were managed by author of this article.

Here are the six critical success factors in project management of biometric authentication systems implementation:

- Comply with basic (iron triangle) project requirements;
- Identify and manage risk of the implementation project;
- Engage charismatic and experienced leader;
- Ensure that the project team will consist of technical people from the vendor and from the organization in which the BAS is implemented (the customer);
- Continually and rationally evaluate every phase of the implementation process;

- Apply the following approach to the implementation process:
 1. Perform the analysis of qualitative and quantitative needs related to biometric authentication process.
 2. Choose the biometric technology according to results of performed analysis.
 3. Formulate base specification of biometric authentication system.
 4. Investigate alternatives to formulated specification.
 5. Choose the best specification of the biometric authentication system.
 6. Model the biometric authentication system.
 7. Design the biometric authentication system.
 8. Evaluate the performance of the pilot biometric authentication system with *complete* set of users which are intended to use the system in production phase.
 9. Implement biometric authentication system in production environment.
 10. Integrate the biometric authentication system with other systems working in production environment.
 11. Launch the biometric authentication system.
 12. Evaluate performance of biometric authentication system.
 13. Monitor the biometric authentication system and provide necessary amendments.

5. Summary

This paper presents the critical success factors in managing implementation-related projects concerning biometric authentication systems.

The implementation process is quite simple from the technical point of view, but limiting the focus just to operational procedure could lead to lowering the probability of success of such projects. The process of the implementation has been observed by author of the article and it has been found, that focusing on the implementation process without the project-oriented perspective, is leading to results which are satisfying the technical criteria only.

In this article we proposed six critical success factors related to BAS implementation projects: (1) comply with basic (iron triangle) project requirements, (2) identify and manage risk of the implementation project; (3) engage charismatic and experienced leader; (4) ensure that the project team will consist of technical people from the organization in which system is implemented, (5) continually and rationally evaluate every phase of the implementation process and (6) apply the following semi-formal approach to the implementation process.

Taking into account specified key success critical factors should result in increased number of successfully implemented biometric authentication systems.

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Omówienie

Artykuł został poświęcony zagadnieniu zarządzania projektami związanymi z implementacją biometrycznych systemów uwierzytelniających. W pierwszej części artykułu krótko scharakteryzowano istotę biometrycznych systemów uwierzytelniających. W drugiej części przybliżono proces implementacji tych systemów, a trzecia część dotyczy krytycznych czynników odpowiedzialnych za sukces w zarządzaniu projektami implementacyjnymi biometrycznych systemów uwierzytelniających.