



## QUALITY OF R&D INFORMATION IN THE DISCLOSURES OF PHARMACEUTICAL COMPANIES IN HUNGARY

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**Abstract:** *The Hungarian Accounting Act and the International Financial Reporting Standards require different accounting treatments and disclosures for research and development activities. While examining ten years' financial statements of five Hungarian pharmaceutical companies, we revealed the differences between the two accounting systems and evaluated the quality of the provided accounting information. Incorporating former researchers' findings, the authors developed a criteria system for content analysis to examine the impact of accounting differences on the quality of accounting information. The financial statements presented on the IFRS basis provided more consistent high-quality information, while the disclosures prepared on the domestic accounting rules showed a variable picture.*

**Keywords:** *Accounting information, Research & Development, Hungarian Accounting Act, International Financial Reporting Standards.*

**JEL Classification** M41 · O30 · D80

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## 1. INTRODUCTION

Research and development (R&D) expenses, and even more so the capitalized R&D costs, can provide useful information to the users of the financial statements on the company's prospects, success, and development (Huang et al., 2020). However, this requires that users can properly interpret the data in the published financial statements and annual reports.

The interpretation of the information contained in the annual reports and the comparability of the financial statements of Hungarian companies are limited by the fact that the companies can prepare their accounts either in accordance with International Financial Reporting Standards (IFRS) or Act C of 2000 on Accounting. While similar disclosures are in both sets of financial statements, they are not directly comparable. There are fundamental differences between the two sets of rules in terms of how a company accounts for research and development expenditure and in capitalization requirements of development costs, when and at what value it can capitalize. These differences mean that the underlying information content of the disclosures is different, so although the disclosures are similar, they are not directly comparable.

Our research focuses on whether financial statements prepared on the basis of IAS 38 or the Hungarian Accounting Act provide more useful information for users.

## 2. LITERATURE REVIEW

A widely accepted and commonly used concept for defining information quality is „fitness for use”. High-quality information ensures adequate data service for its users (Azeroual et al., 2018; Gertz et al., 2004; Kahn et al., 2002; Madnick et al., 2009; Shanks & Corbitt, 1999; Stvilia et al., 2008; Tayi & Ballou, 1998; Wang & Strong, 1996). Quality is often treated as a multidimensional concept to provide measurability (Knight & Burn, 2005).

The early models defined quality mostly in three or four dimensions. Ballou and Pazer (1985) defined four characteristics of high-quality information: accuracy, completeness, consistency, and timeliness. Wang and Strong (1996) conducted a survey in which they classified the characteristics of quality information into four categories: intrinsic quality, accessibility, contextual quality, and representational quality. Within the four categories, they identified 16 dimensions, the most important of which are accuracy and relevance.

Miller (1996) identified ten dimensions along which users determine the quality of the received information. According to his study, the essential components of high-quality information are relevance, accuracy, and timeliness. The accuracy dimension means that the information should reflect the underlying reality, and by the timeliness dimension, data should reflect the reality that is still valid.

Katerattanakul and Siau (1999) defined accuracy and correctness of content as features related to internal quality, published information about the author as contextual quality, organization and consistency as representational quality, and navigation tools as accessibility. Shanks and Corbitt (1999) approached and defined the necessary dimensions from an entirely new sociological and cultural perspective, with consistent representation, completeness, accuracy, usability, usefulness, and shared understanding of meaning as the most important.

Naumann and Rolker (2005) have classified the criteria (dimensions) according to which quality has three classes: subject-related criteria, such as understandability of information, the usability

of information, and relevancy. Object-related criteria, such as completeness, and process-related criteria, such as accuracy. When [Eppler \(2001\)](#) created his model, he defined four vertical categories into which he classified the dimensions that determined quality - criteria for relevant information, criteria for correct information, e.g. completeness, conciseness, consistency, criteria for the optimized process category, and characteristics related to the reliability of the infrastructure.

[Kahn et al. \(2002\)](#) created the following four categories in building their model: correct information (e.g. completeness), reliable information (e.g. timeliness), useful information (e.g. relevancy), and usable information (e.g. accessibility). [Klein \(2002\)](#) investigated the factors most commonly identified by users as problems with the quality of information published on the Internet. Based on an analysis of 132 questionnaire respondents, identified five main factors: accuracy, completeness, relevance, timeliness, and amount of data.

According to [Floridi \(2013\)](#), high-quality information must be adequate in depth and scope. The model defined eight dimensions to assess quality. [Cai and Zhu \(2015\)](#) identified five main dimensions of information quality in their model for assessing big data quality: availability, usability, reliability, relevance, and presentation quality.

[Heinrich et al. \(2018\)](#) used the dimensions of timeliness, completeness, reliability, validity, and comparability to describe the quality of information. [Taleb et al. \(2018\)](#) based their theory of quality measurement on accuracy, timeliness, consistency, and completeness as the main indicators of information quality. [Azeroual and Abuosba \(2017\)](#) identified the main criteria for high-quality information: being error-free, completeness correctness, being up to date, consistency, and timeliness.

Based on the models presented, the most widely used characteristics to determine the quality of information are timeliness, accuracy, completeness, consistency, and relevance. Our research examines the R&D disclosures of Hungarian pharmaceutical companies according to these criteria.

Depending on the context of the information, each dimension can be defined in several different ways ([Floridi, 2013](#)) so that within each model, a characteristic or criterion sometimes has a different meaning. Therefore, for each dimension, we use the definition most relevant to the subject of the research: accuracy, timeliness, and relevance, as defined by [Miller \(1996\)](#), and completeness and consistency, as by [Wang and Strong \(1996\)](#).

Accuracy means that the information reflects the underlying reality, and the closely related timeliness indicates that the information reflects the current reality. Relevant information provides the proper support to achieve the user's goals ([Miller, 1996](#)). Information that is complete has sufficient depth and is sufficiently broad. Consistency describes that the information is presented in the same format and is comparable with historical data ([Wang & Strong, 1996](#)).

### 3. COMPARISON OF IFRS AND HAS REQUIREMENTS

In the Hungarian Accounting System (HAS), companies have an accounting policy choice to capitalize on development costs if they meet the capitalization criteria. The accounting treatment may affect both the accuracy and completeness dimensions due to the possibility of a choice to expense costs relating to ultimately successful development. If the conditions are met, IFRS requires the capitalization of development costs, which in itself may indicate that the disclosed information is adequate in terms of accuracy and completeness.

IAS 38.57 requires the recognition as an intangible asset arising from development if, and only if, an entity can demonstrate all of the following:

- a) the technical feasibility of completing the intangible asset so that it will be available for use or sale;
- b) its intention to complete the intangible asset and use or sell it;
- c) its ability to use or sell the capitalized intangible asset;
- d) how the intangible asset will generate probable future economic benefits. (*Among other things, the entity can demonstrate the existence of a market for the output of the intangible asset or the intangible asset itself or, if it is to be used internally, the usefulness of the intangible asset.*)
- e) the availability of adequate technical, financial, and other resources to complete the development and to use or sell the intangible asset;
- f) its ability to measure the expenditure attributable to the intangible asset during its development reliably.

The standard leaves the assessment of compliance with the criteria to the companies; therefore, the company's decision to capitalize can also be subjective, which may also lead to the recognition of successful projects as an expense. The optionality of capitalization can also have an impact on the relevance dimension. The information is useful for the users if they can learn the company's activities or assess its expected future performance. Suppose the capitalized development costs do not faithfully reflect reality or provide incomplete information. In that case, the information is also less relevant and does not provide adequate support for the user's objective.

The two accounting systems also have different stringency regarding capitalization requirements. HAS leaves companies more freedom in judging the success of a project. In contrast, IFRS determined broadly and detailed the factors that need to be examined in order to declare a development expected to be successful. By applying the more stringent capitalization criteria of IFRS, the estimation uncertainty can be reduced, thereby improving the quality of the information in terms of accuracy.

Both the Hungarian Accounting Act and IAS 38 determine the balance sheet value using the cost model. Although IAS 38 allows the revaluation model for intangibles, it is for development costs, not characteristic because of the active market requirement. The Accounting Act does not allow revaluation of the capitalized development costs to fair value.

Under both systems, the costless amortization and impairment determine the carrying amount. Capitalized development costs under IAS 38 are amortized only in case of a finite useful life. An intangible asset is considered to have an indefinite useful life if, after considering all relevant factors, there is no foreseeable limitation on the time period during which the asset is expected to generate economic benefit to the entity. However, under the Accounting Act, if the useful life cannot be estimated, the asset must be depreciated within a maximum of five years. Suppose there has been a material change in the circumstances taken into account by estimating the amortization at initial recognition. In that case, amortization may be changed, but the quantified impact of the change on profit or loss must be disclosed in the notes. In contrast, IAS 38 requires a review of the amortization period and amortization method applied to all intangible assets with a finite useful life at the end of each financial year. If the assessed expected useful life of an asset differs from the previous estimate, the amortization period of the asset should be adjusted accordingly.

The capitalized value of the development costs cannot exceed the recoverable amount both under IFRS and Hungarian Accounting Act. IAS 36 contains a detailed explanation of the recoverable amount. Under the Hungarian Accounting Act, the capitalized cost of development should not exceed the amount expected to be recovered from the related future economic benefits after deducting further development costs, expected production costs, or directly attributable selling costs.

#### 4. METHODOLOGY AND DATA

The study examines publicly available audited financial statements published by five Hungarian pharmaceutical companies. Ten years of disclosures were analyzed for each company to obtain a comprehensive picture of the companies' R&D activities and the information published about them. The study analyzed the published accounts of the companies between 2011 and 2020. The analysis considered the changes in the disclosures included in each company's accounts, which shaped the scores given. Hence, the final scores reflect the disclosures published in the last year.

Each company's annual report was scored on a scale of one to five for each criterion, with one being the weakest and five the strongest. The scale was constructed for the purpose of this study, based on the models for information quality cited above. The scoring scale is presented in Annex.

#### 5. RESULTS

The scores given to the five pharmaceutical companies' disclosures prepared in line with the Hungarian Accounting Act are summarized in the table below.

**Table 1.** Scores on disclosures in HAS financial statements

	Accuracy	Timeliness	Completeness	Consistency	Relevance	Total scores	%
"A"	3	5	3	5	3	19	76
"B"	5	3	5	5	5	23	92
"C"	5	4	4	5	5	23	92
"D"	4	3	4	5	4	20	80
"E"	4	3	4	4	4	19	76

**Source:** Own calculations

Company A does not mention the accounting treatment for the company's R&D activities in the accounting policy section. In the ten years under review, there was no balance in the capitalized value of development costs, which suggests that the company permanently recognizes the costs incurred in connection with research and development as an expense. However, the accounts do not explicitly provide any information on successful developments. When a user looks at the accounts for a particular year, it is unclear which part of research and development activities are successful development projects in the current year and the comparative period or previous years. The delivered information is so incomplete, as the disclosure does not provide sufficient depth and breadth of information. Company A provides detailed information on the costs incurred in the financial year and a brief mention of the research team. Although there needs to be more information on the company's expectations of success, users can be informed about how innovative the company is and how much it spends on research and development projects.

Company B has detailed principles used in accounting for research and development activities in its accounting policies. It specifies precisely which costs are capitalized and how this provides users with sufficient depth of information to interpret the published figures. The individual assess-

ment of each project helps to ensure the accuracy of the information disclosed so that the disclosures reflect as closely as possible the underlying reality, i.e. the project's expected success. The capitalization of development costs provides a more reliable picture of the company's expected future performance, in comparison to if the costs were expensed. From 2016 onwards, Company B included a breakdown of revenues by business line, which highly improves the relevancy of the disclosures, as it confirms the success of R&D projects. From 2019 onwards, the company has reduced the information disclosed on the costs incurred concerning research and development activities. The relevant parts of the accounting policies continue to be detailed, but the costs presented in the notes are only in a lump sum.

Company C's notes to the financial statements have in detail the accounting policies for recognizing and capitalizing the research and development costs. The company specifies precisely when a project will be capitalized and even sets a precise limit on the expected time to complete the development, helping to interpret the figures and build a more accurate picture of future performance. The rules for amortization of capitalized costs are also explained in the notes. The company determines amortization based on a generally estimated useful life, not the statutory maximum, which helps to keep information more timely. Like Company B, Company C also published a breakdown of revenues by business line, providing highly relevant information for users, as they can gain certainty that the projects were successful and generated revenues.

Although the capitalized value of development costs is presented in the balance sheet from year to year, Company D does not provide any details on R&D in the notes. There needs to be a mention of the recognition of development costs, the criteria for capitalization, or the rules for amortization of capitalized development costs in the section on the main accounting policies. The costs incurred in the year for research and development activities are presented only as a lump sum. However, capitalizing on expected successful developments provides information on the company's innovative activities. Therefore the aggregate presentation of costs was not considered to have a significant negative impact on completeness.

Until 2013, Company E did not choose to capitalize on developmental costs; it expensed all related costs in the year incurred. The accounting policy changed in 2013, and from that year onwards, the company capitalizes on projects that are expected to be successful. Nevertheless, the supplementary notes do not show in detail the accounting policy on the capitalization of development costs. The company presents the expensed R&D costs incurred during the year in an aggregated form. The notes do not include specific information on the calculation of amortization or the determination of useful life related to developments.

The scores show high consistency in all companies; there have been no significant changes in disclosure, so each company's accounts would have scored similar to the last year, even if they were scored separately for each year. Company E decided to capitalize after the third year, whereas previously, all the costs incurred were expensed.

Company C prepares its accounts by International Financial Reporting Standards from 2018 and Company D from 2017, which has changed the information disclosed in the accounts and the notes. The scores for IFRS reporting summarise in Table 2.

While company „C” prepared accounts under the Hungarian Accounting Act, the company has decided to capitalize on development projects deemed successful, in the IFRS accounts, due to the complexity of the requirements, R&D costs are fully expensed in the year incurred. This signifi-

cantly reduces the relevance of the disclosed information, as users are not aware of the company's judgment about future projects that are considered successful. While the timeliness of the disclosures is improved, as only costs incurred in the year are included, the accuracy of the information is reduced, as the disclosure no longer reflects the expected success of the developments. In the IFRS accounts, the company does not disclose the costs incurred in the current year in detail and recognizes all costs as expenses, which, together with the lack of capitalization, harms the completeness of the information disclosed.

**Table 2.** Scores on disclosures in IFRS financial statements

	Accuracy	Timeliness	Completeness	Consistency	Relevance	Total scores	%
"C"	3	5	4	5	3	20	80
"D"	5	4	5	5	5	24	96

**Source:** Own calculations

Company D effectively provided the more detailed disclosure required by IFRS in the financial statements. The IFRS notes include an accounting policy for research and development activities that describes in detail the requirements for capitalization and calculation methods of amortization, thus providing higher complete and relevant information. Defining the useful life individually also positively impacts the information's timeliness, as the development's capitalized costs are amortized over a period corresponding to the best estimate of the useful life, rather than over a generally defined period. Costs recognized as expenses in the financial year are presented in a separate line in the profit and loss statement. Together with the capitalized costs and the related accounting policies, it provides comprehensive information.

## 6. CONCLUSION

The criteria and the optionality of capitalization were the main differences between the two accounting systems, which impacted accuracy and completeness. IFRS requirements ensure a more accurate picture as the conditions are more stringent than those in the Hungarian Accounting Act. In contrast to the HAS, capitalization is mandatory in IFRS financial statements if the conditions are fulfilled. As the disclosure requirements in Hungarian Accounting Act are less detailed and there are no formal requirements, we found that the information disclosed in the financial statements prepared in accordance with this law is very diverse. More detailed accounting requirements in the Hungarian Accounting Act would improve the quality of the information provided to users of the financial statements.

In reality, among the companies preparing both HAS and IFRS accounts, one decided not to capitalize on development activities because of the uncertainty of compliance with the criteria. Due to the stricter capitalization criteria in IFRS, we expected a derecognition from the intangible assets by the transition to IFRS, but this did not happen. Add to this the decision of Company C to no longer capitalize development costs in its IFRS accounts, and further research questions on the criteria for capitalization may arise.



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## ANNEX

### Accuracy:

1. does not reflect reality at all, does not use the capitalization option, does not show costs incurred
2. does not use the capitalization option, costs are aggregated
3. does not use the capitalization option, shows costs in detail
4. makes use of the option to capitalize but does not provide information on what is capitalized and how
5. projects expected to be successful are capitalized, providing detailed information on the conditions for capitalization

### Timeliness:

1. does not faithfully reflect the state of the current date, presents historical or posterior data, does not recognize amortization
2. does not provide information on the amortization charged
3. provides general information on amortization without specific reference to developments
4. provides detailed information on the method of amortization and useful life of developments
5. perfectly reflects the situation at the date (in the balance sheet) and period (in the profit and loss account)

### Completeness

1. the disclosure is incomplete, does not reflect reality, material data are not disclosed or cannot be interpreted
2. significant relevant information is missing, which makes interpretation difficult
3. provides only numerical information on material data, with no explanation to aid interpretation
4. material information is missing, but the loss of information is not material, disclosure is sufficiently broad
5. the disclosure presents all relevant information as accurately as possible.

### Consistency

1. disclosures are not comparable
2. most of the disclosures have changed, and only a small proportion are comparable
3. some of the disclosures have a major change in principle or form, but the impact is not quantified
4. some of the disclosures have a minor change in principle or form, but the comparability is not significantly affected
5. disclosures are comparable, and the formatting and accounting policies are consistent

Relevance

1. the disclosure does not serve the purpose of the user and does not provide information on future performance
2. the report only provides numerical, aggregated information for the financial year; comparative figures are missing
3. the report only provides numerical, detailed information for the financial year; comparative figures are missing
4. the financial statements provide the user with information on the future performance of the company based on estimates
5. the report provides the user with the most immense possible assurance