Paragon Software: Turning gigantic print reference content into light-weight apps with cutting-edge features

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The digital dictionary market is maturing, providing new opportunities not only for large and prominent publishing houses, but for smaller ones as well. Independent authors come up with rare reference editions adding new languages, unique dialects and very specialized vocabulary to the wide spectrum of already established traditional reference and learning brands. Paragon Software encompasses all languages and dialects, in the aim of creating digital applications that satisfy all mobile user reference and learning needs.

Since its launch in 1994, Paragon has brought to the mobile market more than 2,000 titles based on its proprietary Slovoed compression technology, which compresses even the largest-known print volumes (such as *Britannica Concise Encyclopedia* and *Webster's Third New International Dictionary, Unabridged*) to the tiniest apps taking minimal memory space and offering fast look-up functions. This advanced technology has already been employed by dozens of publishers around the globe. One of the latest joint projects, to be accomplished in August 2013, is the release of the K Dictionaries' PASSWORD series apps, consisting of over 40 semi-bilingual English dictionaries.

Slovoed makes it possible for publishers to offer their titles for all available platforms – whether desktop, mobile or web-based – broadening the appeal to a range of consumers while decreasing time-to-market. The essentials of the digital development process are presented in this article.

1. Reliable conversion technology to re-create the brand

The publisher's first steps in the mobile world begin with converting print content from PDF, MS Word, InDesign, MS Excel or other formats into the engine-compatible digital format. The biggest challenge and the end goal of successful conversion is to communicate all brand elements into a mobile version and to present the user with similar design, look, colors, logo and other visual components as those of the print edition.

In order to provide a complete brand correspondence as well as utmost comfort and benefits for the end-user, the Slovoed technology restructures dictionary entries by separating them into components such as examples of usage, translations, phonetics, parts of speech, tables, pictures, and other groups. The structuring operation permits the developer (in agreement with the publisher) to add to the app new advanced features, such as colored markup, hyperlinks between articles and directions (for example, English-French or French-English), the possibility to hide or display specific information (examples, comments, etymology, etc) in the entry for a more customized view on a mobile device, and many other features.

2. Simultaneous multi-platform development

The key point a publisher should consider when entering a digital dictionary market, is that it has a highly variable structure, where the revenue level depends on popularity of a certain platform (i.e. operating system). Platforms continuously replace each other, winning market share, bringing unexpected breakthroughs or ruining hopes. Thus, some titles for Mac OS may bring more revenue than those for Android, or vice versa. It's all relative. This instability of the digital dictionary market raises tricky questions for publishers, such as which platform to choose, and how to secure one's investment in case of poor performance of a new platform (e.g. Bada, Windows Phone, Blackberry) and avoid such risks.

Slovoed attempts to ensure a stable revenue level by providing multiple platform support. The engine supports more than 15 platforms – from Palm OS, Java, UIQ and Symbian to Android, iOS, Mac OS and Windows 8. Paragon's 18-year experience has proved that a cross-platform approach is the core of a long-term strategy in digital dictionaries. To implement this idea, Slovoed technology uses Device Agnostic Data Format (DADF), which is a digital data format that does not depend on the operating system into which it is implemented.

Using DADF simplifies the product development to shell migration only and reduces development costs per title (e.g. by incorporating the keyword list, articles, sound, morphology, grammar, etc). For example, a database developed for iOS

can be used on another platform (e.g. Android) without the database recast. In conjunction with multiple development teams (one per platform) that can work on many dictionary projects simultaneously, Slovoed's cross-platform approach decreases a product's time-to-market and enhances stable revenues.

3. Innovative end-user features to take advantage of the device's capabilities

Recent services and technologies, such as from Google and Apple, have raised user expectations so highly, that developers have to create apps with features that meet these new standards. Slovoed technology for mobile and desktop platforms offers premium opportunities for users to translate and learn languages, featuring intelligent search tools, full-sentence audio pronunciations by native speakers, grammar tables, vocabulary tests, sophisticated input options, friendly UI, etc, and guarantee very fast and intuitive operation. Here are the essential features:

- A morphology module analyzes and provides translation for words entered in any grammatical form (plural nouns and adjectives, verb inflections, etc). Since most words occur in speech in inclined or conjugated forms, it may be tricky for a language beginner to figure out an infinitive and to get a proper result.
- When a user enters a query into the input field, the engine automatically builds a list of different entries through the entire dictionary that contain the query.
- Slovoed finds precise word translations containing all usage examples.
- Full text search allows users to look up a word not only in headwords, but also through all available translations and examples of usage in the entire dictionary. The app delivers comprehensive results that offer users instant access to all available content, along with a thorough analysis of all findings. For example, by typing the word **taste**, the user will see not only the entries and links to the most relevant entries but also others such as *discriminating* and *educated* that happen to provide examples of phrases with this word. As a result, the translation becomes more comprehensive and detailed.
- Full text search involves the morphology module and 'Did you mean…?' functionality, and thus finds almost all search queries regardless of misspelling or grammatical word form.
- Search results are displayed in both languages (for bilingual dictionary apps).
- Along with powerful search options, users can write words or phrases by hand without using a keyboard. This new handwriting

recognition capability is enabled through the integration of Paragon's proprietary handwriting recognition PenReader technology that supports 30+ languages.

4. Trim the sails to the wind: marketing

Once the application development has been finished, the most important next step is to market the new product and submit it to online sales channels, such as the iOS App Store, Google Play Store, Amazon App Shop, Windows Phone Store, and others. Paragon is a leading expert in marketing services, successfully managing more than 2,000 reference applications in the company's own online distribution platforms for every major app store.

5. Web services

Looking closer at the user interaction patterns for mobile and desktop devices, we find that global giants like Apple and Google influence them too. Thus, iOS 6 with its iCloud Tabs allows users to sync browser tabs between different devices and continue viewing the page right where it was left on a previous device. A similar technology is supported now in a recent version of Google Chrome for iOS. As a result, the user gets a hitherto unknown mechanism of cross-platform content consumption on multiple devices and browsers with seamless access to the content of interest.

Paragon has applied the trend to mobile and desktop apps and introduced the Slovoed Online dictionary web service. Now users of mobile apps, powered by Slovoed, can get free access to their dictionaries online and, what's more important, synchronize their search history. No matter where the users are situated – in the office, in front of a laptop, or on the go with a smartphone in hand – they get the desired content in most comfort and context.

6. Open Dictionary API Initiative

The latest initiative by Paragon, aimed at integration of new opportunities for promoting dictionary apps, is an agreement with the Open Dictionary API Alliance (ODAA). ODAA is the first non-profit open community that provides open versions of in-app translation tools to software developers and organizations. Now third-party developers of e-books, journals, encyclopedias, office documents and social media apps for Android and iOS can integrate instant in-app word translation functionality and cutting-edge dictionary products into their own apps without any fees. Through this integration, mobile users can read foreign literature and documents in multiple languages without leaving the active application.

Paragon Software
- Operating in the mobile reference business since 1994
- Headquarters in Freiburg, Germany
- Development offices in Moscow, St Petersburg, Obninsk
- Sales offices in Irvine CA, Tokyo, Shengjeng
- 80+ employees in digital publishing team
- 15+ supported operating systems (OS) – including Android, BlackBerry, iOS, Mac OS, Windows 8, Windows Phone
- Dozens of publishing partners – including Collins, Duden, Encyclopædia Britannica, K Dictionaries, Langenscheidt, Merriam-Webster, Oxford University Press, Pons
- 2,000+ apps – including dictionaries, phrasebooks and encyclopedias
- 40+ languages
- 40+ features
- Millions of users worldwide
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