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Optimizing Mobile-Device Design with Targeted Content

The new Intel® Mobile Design Center portal has increased the number of mobile solutions Intel SoC customers take to market and has decreased time to market for those solutions.

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Executive Overview

In order to assist mobile-device-design customers, Intel has created a new content repository that simplifies the process of finding the documentation they need. Until recently, customers who design mobile devices often had difficulty locating Intel design information because the content was housed in multiple locations, often in long-form documents—up to 20,000 pages each. Locating information for client projects often required the help of multiple Intel engineers.

Intel IT designed the Intel® Mobile Design Center portal to achieve the following goals:

- Provide best-in-class content-delivery methods.
- Provide flexible, dynamic web-based delivery and notification tools.
- Improve the overall customer experience.
- Require fewer Intel resources to support customer projects.
- Increase the number of solutions designed.
- Reduce time to market.

To realize these goals, we worked with the business to separate content development from content presentation (appearance). The business group responsible for mobile-design documentation created topic-based blocks of highly specific information using Darwin Information Typing Architecture (DITA) XML-based content authoring for critical information. The new content-delivery approach required us to develop key components for managing and publishing the content, including a reference library and a content pipeline.

Mobile-design customers can now assemble important information quickly by using the topic-based search engine, filtering for topics of interest. The new Intel Mobile Design Center portal has increased the number of mobile solutions Intel customers take to market and has decreased time to market for those solutions. It lays the foundation for process and content improvements across the enterprise.

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Acronyms

DITA Darwin Information Typing Architecture

SoC system on a chip

Business Challenge

Intel manufactures and markets several system-on-a-chip (SoC) platforms for use in small form factor devices. Device manufacturers need documentation to use these SoC platforms in the design and development of their smartphones and tablets. Intel has historically made this documentation available through the Intel® Business Support portal and other channels.

Unfortunately, hardware developers had trouble locating the information they needed due to multiple, disparate documents that were lengthy—sometimes as long as 20,000 pages—and often difficult to find. The content and existing portal lacked interactivity, and often the help of multiple Intel engineers was required to support clients seeking design information.

Through a customer survey and an internal analysis, the business identified the following areas for improvement:

- Technical product information, engineering design files, and other relevant types of documents were fragmented and required multiple manual touchpoints to maintain.
- SoC customers required several tools to manage product issues, presenting a disjointed process and poor user experience.
- Information on design requirements was spread across multiple documents and content repositories, making these requirements difficult for customers to locate.
- Customers were not always notified when content changed or when new information was made available.
- Form factor reference design did not meet customization targets for groups of pretested features certified by Intel, requiring as much as 90 percent customization by the customer, leading them to develop their own mobile solutions.
- Security improvements were needed to protect highly classified information.
- Design documentation for configuring hardware and software platforms continues to grow in volume, adding further complexity and promising future challenges for locating information.

By aligning the value and purpose of Intel's mobile-device-design business with enterprise goals, we identified the following improvement goals:

- Increase the number of customers using Intel's SoC platforms.
- Provide best-in-class content-delivery methods.
- Provide flexible, dynamic web-based delivery and notification tools.
- Improve the customer experience.
- Reduce the amount of time Intel engineers spend helping customers find design documentation.
- Increase the number of mobile solutions Intel customers take to market.
- Reduce customers' time to market.

To achieve these improvements we designed the Intel® Mobile Design Center, an extensible, reusable documentation platform for SoC customers. However, we realize that these challenges are not unique to mobile-device-design customers. Therefore, we designed a scalable documentation solution that would enable other areas of Intel's business to benefit in the future.

Solution

We designed a solution that eliminated the need for the previous long-form documentation. Instead, the solution enables SoC customers to assemble relevant content based on topics of interest. To achieve this, the mobile design business changed its documentation structure to topic-based content so that customers can quickly find highly specific information, enabling faster time to market for their mobile solutions.

The solution enables SoC customers to assemble relevant content based on topics of interest.

Intel® Mobile Design Center Architecture

Intel IT and the business had the following objectives:

- Create an extensible document portal that provides access to topic-based information.
- Provide customers with self-service tools, including issue tracking, in one portal.
- Reduce the amount of time Intel's engineers spend helping customers find information.
- Provide content-delivery solutions that could improve processes beyond the Intel Mobile Design Center into other areas of the business.
- Notify customers of relevant content changes and additions.

In addition to aiming for these objectives, we knew that the approach needed to use existing IT enterprise capabilities, such as federation, single sign-on, user-profile provisioning, product-issue management, and file transfer protocols.

We separated the process of content development—including structure, tagging, management, and delivery—from content presentation—the way the content appears in the Intel Mobile Design Center portal (see Figure 1). The portal delivers a targeted user experience based on customer permissions and goals. To manage the portal and the user experience, we chose a third-party, cloud-based solution that provided the following components of the overall solution:

- **Dynamic user interface.** A consistent, interactive, and highly visual user interface provides customers with options for searching, compiling, and subscribing to topics of interest.
- **Identity management.** The portal is integrated with existing federation and single-sign-on tools for easy access to content based on permissions. Additional attributes offer custom levels (tiers) for managing access to content by device platform and classification (see [Security and Entitlement](#) for more information).
- **Issue-management integration.** The Intel® Premier Service, our newly standardized issues-management application, is accessible through the Intel Mobile Design Center portal, eliminating the need for customers to log in to separate portals.
- **Filtered search.** Customers can search at the SoC-platform level, using filters to find the topics they need.

Intel IT developed the following components for managing and publishing the content:

- **Intel Product Information XML.** A part of the content management system, the Intel Product Information XML is used to create and manage Darwin Information Typing Architecture (DITA) structured content.
- **Reference library.** The reference library is the content hub, converting all relevant platform content (bundles) into XML and routing them to their final destinations.
- **Content pipeline.** The content pipeline uses Intel's file transfer system and the reference library's subscription service to notify users when new or updated content is available. Content bundles, or all related information for a platform or subsystem with applicable metadata, are transferred to the Intel Mobile Design Center portal.

Structured content is managed through the technical information platform using DITA XML. This content is tagged with metadata to provide topic-based information that customers can easily find and bundle into custom documents.



Figure 1. Published content resides in the content management reference library, which is separated from its presentation to the customer in the Intel® Mobile Design Center portal.

Content Structure

To deliver highly searchable topics to the Intel Mobile Design Center portal, we created a model for transitioning the most frequently searched information into topics using DITA-based authoring. This model provides customers with the ability to select items from platform maps and compile them into virtual binders for later use. Converting all legacy content (hundreds of thousands of pages) would have required too much time and resources, so we focused on converting only the critical documents to the new structure, while adopting the new DITA XML structure for future content authoring (see the Darwin Information Typing Architecture sidebar for more information).

As shown in Figure 2, the reference library routes all content bundles with the required metadata through the content pipeline to the Intel® Mobile Design Center portal. Three types of content are available on the Intel Mobile Design Center portal:

- **Critical content.** Documentation designed for the Intel Mobile Design Center portal, including DITA XML-based technical information, platform firmware, supported operating systems and software, and Intel tools. All technical information identified as critical were converted to the new topic-based XML structure.
- **Legacy content.** The previous Intel Mobile Design Center contained legacy information that was not transformed into structured DITA XML format but is still available in folder structure for browsing.
- **PDF documents.** All SoC-related content in existing PDF format is also still available. To provide better search capabilities for this content, we developed a thesaurus-based search to help customers better locate information.

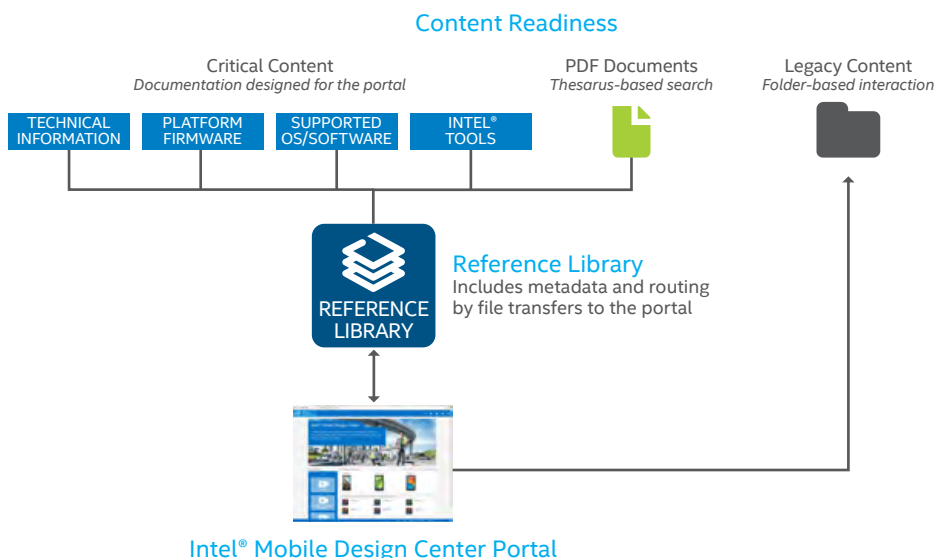


Figure 2. The reference library routes all content bundles with the required metadata through the content pipeline to the Intel® Mobile Design Center portal.

Darwin Information Typing Architecture (DITA)

To provide users seeking information with small blocks of relevant content at the topic level rather than document level, we used DITA XML. DITA is an open standard for structuring, developing, managing, and publishing content. Information is authored in individual topics that can be configured in various ways using DITA maps and then published in various formats for personalized delivery to the user.

- **Topics.** A topic is the basic content unit of DITA, defined as a unit of information that can be understood in isolation and used in multiple contexts. Topics are short, they address a single subject, and they are standardized to include defined elements, such as name, title, information type, and expected results.
- **DITA maps.** DITA maps identify the products a topic is associated with and the target audience. All these things help determine which topics are included in search results. DITA maps also include navigational information, such as tables of contents.
- **Output formats.** DITA-based content can be delivered in various formats, such as web, email, mobile, or print. For ease of use, the content's final design and layout—its presentation—varies to accommodate the unique characteristics of each output format.

DITA authoring supports small blocks of information that can be aggregated in context for the consumer, instead of monolithic PDF documents. Authoring in DITA requires specialized technical capabilities, which were already in use by Intel documentation teams across the enterprise prior to the implementation of the Intel® Mobile Design Center.

Content Security Classifications in the Intel® Mobile Design Center Portal

- Public
- Intel Confidential
- Intel Restricted Secret

To meet user expectations, all related content for a platform or subsystem needed to be linked through metadata in the reference library. Table 1 provides a sample list of metadata tags applied to all content in the reference library. The integrated identity and access management systems on the Intel Mobile Design Center portal provision content based on this metadata.

Security and Entitlement

The Intel Mobile Design Center portal provides several levels of content security classification up to and including Intel Restricted Secret. Intel Restricted Secret information can be delivered only in PDF format or as structured content. Restricted ZIP files are encrypted in the reference library. Encrypted files are sent to a file transfer service job, which delivers the encrypted files to the file transfers system for final delivery to the Intel Mobile Design Center portal. The portal decrypts the file using the public key and passphrase exchanged by Intel and the third-party vendor that manages the presentation components of the portal.

Identity and access management are handled on two levels:

- **Coarse-grained access.** The identity-management component takes advantage of Intel's existing tools for federation, single sign-on, and access management. The Intel Mobile Design Center portal hosts user profiles locally and uses SAML (security assertion markup language) attribute exchange to provide general access to the Intel Mobile Design Center portal, to the integrated issue-management application, and to the legacy Intel® Mobile Communications portal.
- **Fine-grained access.** Application-specific entitlements are managed by each individual application, such as access to an administrator interface. We also incorporated portal-specific attributes to manage those attributes that are not part of the enterprise identity-management system, such as a person's email address and role.

Table 1. Metadata tags applied to documentation for targeting and delivering content

FileID	File Identifier	Example or Option
Name	File Name	—
Title	Content Title	—
InformationType	Content Type	<i>sales and marketing</i>
PPC	Program Project Collection	<i>Intel® Atom™ Processor Z35x0 series platform</i>
ContentInfo	Content Description	<i>engineering files, computer-aided engineering, and so on</i>
Language	Content Language (5-character code)	<i>en-US for English</i>
SecurityClassification	Intel Security Classification	<i>Public, Intel Confidential, Intel Restricted Secret</i>
IsControlledTechnology	Controlled Technology	<i>True/False</i>
Format	Multi-Purpose Internet Mail Extensions (MIME) Type	<i>type=application/pdf exts=pdf, enc=x-compress exts=z</i>
Event	Action	<i>Create, update, delete, or expired</i>
BatchID	Batch of File Transfer	<i>date and batch number</i>

Training

To help our SoC customers use the portal, we provide an online learning component including short videos that explain the features and benefits of using the portal, the options available for each device platform, and specific task demonstrations. Different videos are presented based on customer permissions. FAQs (frequently asked questions) are also available.

Using tracking tools, including both Intel-provided and third-party solutions, we can manage trends and target our training to meet the needs of the audience.

Results

The implementation of topic-based documentation has improved our SoC customers' ability to access the content they need without burdening them with many pages of unnecessary information.

Before we transitioned to structured content delivery, numerous Intel engineers helped customers find documentation and platform designs. Now, with the transition to Intel Mobile Design Center, customers can self-serve. In many cases projects no longer require any assistance from Intel engineers. We estimate that the ratio now is approximately less than one Intel engineer to each customer project.

Customer satisfaction scores have also significantly increased because of the Intel Mobile Design Center portal, from 69 percent before implementation to 80 percent after. Improved customer experience contributed significantly to overall customer satisfaction. As shown in Figure 3, the consistent, easy-to-use interface allows customers to search for, assemble, and subscribe to content based on their unique design needs.

Intel® Mobile Design Portal Implementation Customer Satisfaction

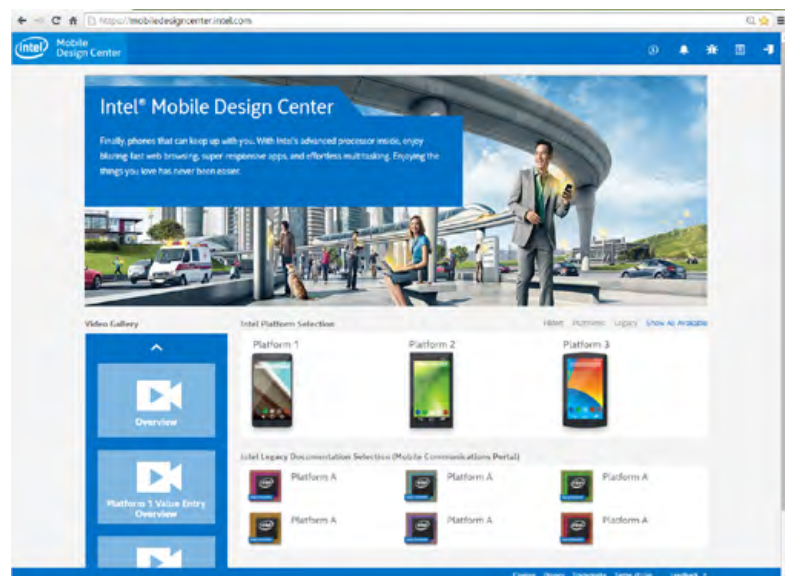


Figure 3. The Intel® Mobile Design Center portal delivers a targeted user experience based on customer permissions and goals.

Conclusion

The process improvements realized when we implemented the Intel Mobile Design Center portal have laid the foundation for process and content-structure improvements across all of Intel's content-delivery solutions. We plan to begin looking at other areas of our business, such as custom build automation and modular partitioning of delivery software and design engineering files, to determine what process changes are necessary to take wider advantage of the new framework.

Intel's use of DITA XML to deliver highly focused, topic-based content has enabled mobile-device-design customers to quickly find and assemble important information without the burden of extraneous documentation. The delivery of topic-based content has increased the number of mobile solutions Intel customers can create using Intel SoC platforms and decreased the time it takes them to bring those solutions to market.

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