Whitepaper

Browser Link Management in Organizations

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Introduction

Everyone experienced the following sentences around URLs in a business context:

- "I don't have the URL to xy anymore, could you please send me the link?"
- "There has been a browser update, all my favorites are gone. I cannot work anymore"
- "The history of my address bar has been cleaned. I must go through tons of mails to get the links back!"
- "Here the link to the team-launcher page. All the good links are there."
- "I get a connection error; did you manage to access the page advertised on the poster?"

Most resources for the day-by-day work are accessible from the browser. And "Browser" means that the user needs to have the URL to access the resource.

To have and manage all relevant URLs becomes a central lever for effective usage computers in general. But the awareness, that the availability of URLs for the end-user needs to be managed, is often not well established. In the manufacturing industry it is common sense to optimize accessibility of the physical resources, i.e., tools and materials for a productive workflow. But the understanding, that optimization of access to electronic resources and especially URLs has the same potential as shopfloor optimization, is just at its beginning.

It has been already realized that the bookmark function of the browser is not a sufficient mean of tackling the URL management. But due to the relatively new problem area, many organizations do not have structured and working processes for URL management.

Having an organized and quick access to the Web-Addresses needed to perform the job is a significant lever for effective work with the computer. Losing the access or having a cumbersome process to reach the target has a significant commercial impact:

- Without URLs/Links (tool access) people cannot work
- Time to search for URLs is work time
- People use old data and even wrong tools since they do not know the latest ones

This whitepaper provides an examination of the problem and offers potential solutions for structured management of links inside an organization. For each class of links proposals for effective link management are given in order to improve efficiency and accelerate work in the office

The Challenge: Finding URLs in the Internet and Intranets

Links in the Public Internet

For the links of from the public internet, the problem of getting the needed links is less problematic. Public websites can be usually found with a public search like google and an entire industry, the Search Engine Optimization (SEO) formed itself around techniques to be found by a search engine.

After finding the needed service or page, the URL the resource can be bookmarked and shared for further or later use. Good web pages support this by having URLs that can be "bookmarked". To achieve this from a technical perspective, the website needs either to integrate the id of the asset to the URL path (http://mypage/..../article/42) or to make sure, that the id of the asset is part of the URL parameter (i.e. http://mypage/....?articleid=42).

To enable finding pages or resources by the search-engines, content on public websites is designed to be indexed (or "crawled") by search engines. Crawling means that a search engine like google scans and indexes all findable pages. SEO companies offer dedicated services to optimize the finding of assets on web pages.

Intranet

For pages in intranets the situation is dramatically different: Intranets are usually not designed to be "crawled" by a search engine. Crawling activities in intranets are usually deemed as a sign for a hacking-attempt. And even if there is an internal crawling search engine, it would not perform well since internal websites usually do not run through a SEO activity.

Search-Engines in large and usually technically heterogeneous intranets follow rather an approach of "federation": Passing a search term to the intranet search engine distributes the search to the connected systems in the intranet and collects the search-results for the user. But implementing the needed interface to a search-engine is usually not part of the specification of an internal service. As a consequence internal search engines often do not perform very well.

A second aspect is that internal systems are often as well not designed to make resources or even searches "bookmarkable". But even the second best choice: The sharing of a search for a given resource is often not supported. A common requirement for internal systems is to be able to store searches or filter settings per user, but only few systems contain means to share a filter setting or search by an URL.

A common practice for at least making a system visible is to add a reference to an internal business dictionary or link database. This has as well some limitation in the practical use. The requester or stakeholder for an internal system usually has a defined set of users. When the system is ready, some trainings or presentation meetings are held and a mail with the link is sent around. There is no pressing need to announce the system to a public audience.

When the system is rather a platform like a dashboard-generator, the link to the generator itself might be added to the link database or business directory, but the link to an implemented dashboard is usually not subject of being added to a business directory. Unless some additional activities are taken, these resources (and their URLs) remain hidden and will not be found by users using a search engine or the link database.

Consequences and Change Processes

As illustrated above, the task of making links easily findable in a corporate environment is not a "no-brainer". To avoid the commercial impact of missing URLs, two main pillars need to be treated:

1) An awareness on management and user level needs to be created that Links to intranet resources are of high business value and need to managed at the same level as tools in a workshop.
The effort of employees who work on this topic on group or organization level should be appreciated and valued. On higher organizational level if should be formalized with a fixed budget to perform this essential task
2) Technical means need to be provided to manage sites and links (beside browser bookmarks) on corporate level

Classes of Links to be Managed

Link management needs to be performed on different levels inside of an organization. For the approach described in this whitepaper, the links are divided into three classes that need separate toolsets and treatment.

Links for Individual and Frequent Usage

URLs that are collected for individual- or very frequent usage, are the first class of links. These links are collected during the normal work (or private) activities usually as browser bookmarks. The user treats this collection of links as a private matter and usually organizes these links as bookmarks along personal preferences.

The bookmarks are like desktop icons or shortcuts an electronic extension of the physical user workspace:

1) The first (physical) level of the personal user workspace is the desk of the user. There is a common sense, that a well-arranged desk supports productivity of the user.
2) In the first step of digitalization (in the pre-web age), when resources and tools had been mainly installed applications, the arrangement of Icons on the "desktop" or "start menu" has been the first logic extension of the physical desk.
The acceptance that the desktop needs as well some cleaning and arrangement is significantly lower compared to the physical desk. Desktops flooded by icons have been rather commented with a "Uh... my desktop looked the same" instead of thinking that the respective user needs some guidance of managing the electronic work.
3) The browser bookmarks are the next extension of the operating systems desktop. Like icons, the bookmarks are the path to access the tools for the task to be done. And just like the operating systems desktop, this area is perceived as a personal matter, and guidance or even rules for organization have a low acceptance.

Links Used by Employee Groups

URLs shared inside of organizational- or project-teams are the second class of links that need to be managed. These links are usually less frequently used and do not find there way into the bookmarks of the members of the group. It is often rather the opposite: The members of the group usually expect that

someone else provides these links as part of the workspace to the group. The URLs for a group need to be manually curated and organized in a suitable way for the group. Three subgroups of these links can be identified.

Team Pages

When a new team member arrives, one of the first actions nowadays is to send a mail with the "important links" to the newcomer. Which links are part of this mail is usually bound to the knowledge and preference of the sender.

With the introduction of systems that allow to setup web-pages by the users themselves (like Wikis, SharePoint servers, Homepage-systems or Google-sites) the introduction mail to newcomers imploded in a best case to a link to the team page (or –cockpit) that concentrates all links. Unfortunately, team pages have an inherent tendency to be orphaned: As soon as a team member found a good link she will add this link to the own bookmarks, and the team-page will not be called again. A second aspect is that the maintenance of the links and page is one of these unpopular "group" tasks like emptying the dish-washer in the pantry. It is always the same group of team-drivers that do these jobs and usually they do these jobs out of personal motivation.

Project Pages

A second category of curated link lists are project pages. It became common sense to create a special project folder and maybe a project chat-group, but to create a "project page" with all essential links around the project is unfortunately not well spread. If well created, a project page can be the bridge between the browser-bookmarks and a centrally curated link list. While working on the project, the bookmark of the project page is positioned at prominent areas directly in the bookmark bar. When the project closed, this bookmark wanders usually slowly to less prominent areas like the /projects folder and then later to the /projects/archive folder.

The maintenance of these pages is during the project usually less problematic. If the project manager realizes the added value of a project page, she will maintain the links on her own or delegates this task.

Task Pages (-Areas)

Dedicated task pages or -areas for a given task inside of a Team or Project can be concentrated in "Task pages". "Task pages" are the direct equivalent of a physical workstation for a special task: Performing a complex task inside of a team or project involves usually a various IT-tools or resources that are not connected. All tools and materials for the task that needs to be performed are concentrated and arranged for a maximum of productivity.

As an example, take a release of a new tool-catalog:

1. A release not has to be written and sent to a peer group (Release note folder)
2. The test results have to be documented (Test tool),
3. The tool-catalog has to be released technically (Release tool)
4. A new working version for the next release is created (Project development folder).

All these tasks are done in tools or folders accessible with URL-links. To speed up the process and release the release-staff from searching for links, a "Release Page" has been set up that presents all needed links for the release in the order of usage.
Depending on the size of the task, this can be a dedicated area in the main page or an own page.

Links to Corporate Resources

The third class of links point to resources that are centrally created and managed. These links are called rarely, but then from a high number of users. In case of a problem, the frustration scales with the number of employees. The lifetime of corporate resources ranges from "very short" e.g. a link to the "Corporate Christmas card of the year" to practically "infinite" like the link to the HR or legal department. Two kinds of centrally managed resources can be distinguished: Links to tools and links to dedicated pages (that can be a page inside of a tool).

The links to tools are usually maintained by the owner of the tool. The challenge around this type of links is the distribution of new and updated links and the awareness of changes by the central team that manages the links.

Pages are created by a central team or by the groups themselves. For group pages, a central team is usually not notified, when a group creates or updates content pages. Unless the system used for creating a that page cares for the accessibility trough a searchability or tree structure of the pages, the pages will remain hidden unless shared explicitly.

Strategies and Tools for Link Management

The presented three classes of links have different use cases and lifecycles. At least three strategies for link management can be proposed.

Management of Links for Individual and Frequent Usage

URLs for individual usage can be managed by browser bookmarks. Bookmarks for individual use are usually structured to personal preferences and habits. The structure of how a user organizes the bookmarks reflects this and should not be dictated by the central IT. Links in this class are usually shared on demand or pushed by the user to a peer group.

The main support that can be given by a central IT is to automate as far as possible the backup of the users bookmarks so that they can be restored in case of need.

Two areas of central activities remain:

1) A change process needs to be initiated that creates at the users awareness for the value of their bookmarks and the need for backup.
2) It turned out, that basic technical know-how of how to use the bookmarks function in the browser is not well spread among typical business users. Training sessions or tutorials for effective bookmark management should be offered

Management of Bookmarks in Folders

The number of bookmarks to be managed in a classic corporate context exceeds the 7-15 bookmarks that can be added to the bookmark bar of a browser. Depending on the area of work, the number can easily reach 100 or more. All major browsers offer the possibility to structure bookmarks in folders. And even the bookmark bar allows to have folders, that act like classic menu-bars of operating systems.

Optimization of Bookmarks

The strategy of structuring bookmarks should follow a classic workplace optimization approach that aims to minimize "ways". Ways at a physical workplace are obvious, but in an electronic workplace there are as well ways. The equivalent of a physical distance in an electronic workplace is the amount of navigation steps and their physical distance on a screen that are needed to reach the UI-Element of need.

For the stored bookmarks this means that the average electronic distance to reach the target shall be minimized. In a western environment with a left-to-right/up-to-down reading direction this means practically that the most frequently used bookmark shall be placed at the top-left position in the bookmark bar and some archive-folder of a project from 2 years ago can dwell in a folder at the path "/bookmark-bar/bookmarks/projects/archive/projectXY/archive".
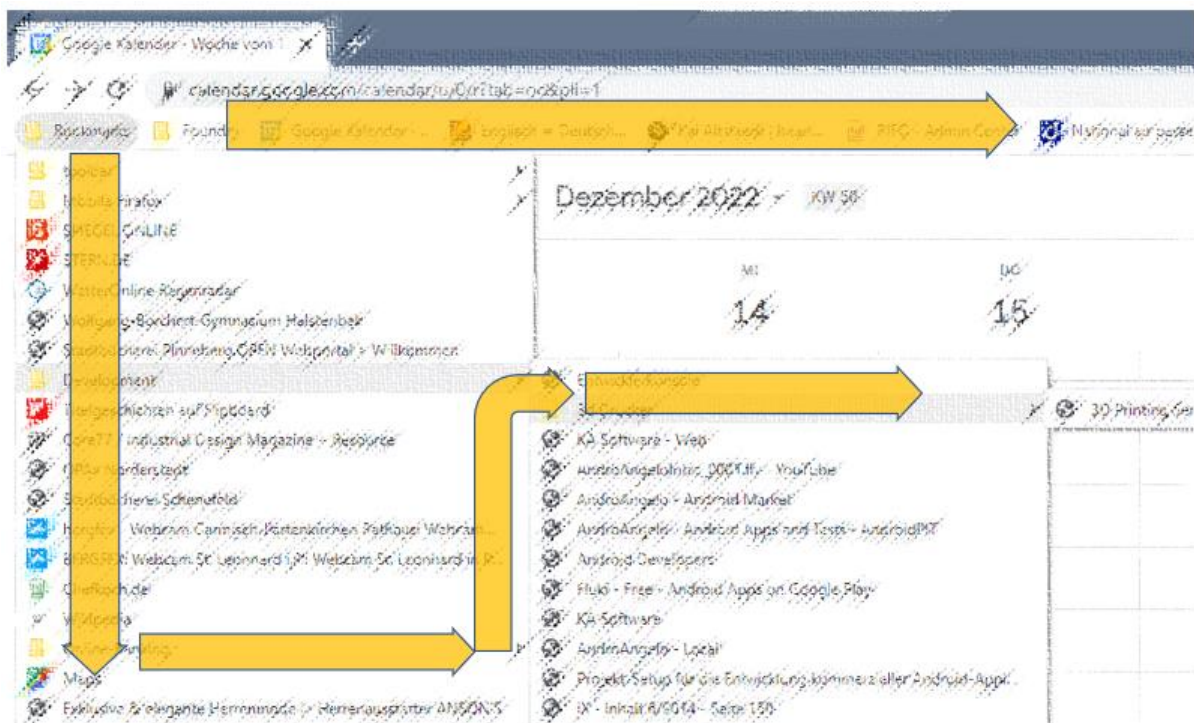

Illustration 1: Organization of browser bookmarks in the bookmark bar and folders

Cleaning and sorting of the Bookmarks should be thought of being part of at least the "spring cleanup"

Management of Links for Employee Groups

To support the creation of pages/sites for groups, a software solution shall be implemented that allows users to create sites or pages on their own and then share the link with the members of the group or inside of the organization. On these sites/pages the editors, which are usually team members, can create content and link-lists for the group.

There are some soft drivers that should be respected when selecting a tool:

- Ease of use: As laid out before, pages for groups are often maintained by motivated group members for their peer group. The technology/products used to build pages for groups should be easy to use to be usable by this usually non-technical staff.
- Perceived Ownership: A group page should give the editors a feeling of "owning" the page. It needs to become a "baby" of the group – especially when it is a team page. Having just a page inside of the domain web-page, will not generate this feeling.
  In a best case, the team page has its own URL.
- Branding: When a group sets up a team page, it usually wants to give the page a branding or personalization. The used tooling shall allow an easy branding and adaption to bespoke layouts.
- Extension points for dynamic content: Pages for teams have to tendency to move towards dynamic pages: A first request might be to include the team-calendar, then a task-list and step-by-step the initial, lean homepage of the team becomes a complex team-management site.
  In the best case, the used tooling shall allow a seamless integration of dynamic content.
  If the support of dynamic content increases the overall complexity of the tooling, it might happen that only a few members of the team know how to configure the page and soon people start to set up again a small page with "just the links we need".

Common tools to manage intranet sites are Wikis, SharePoint server or Google Sites.

Management of Links on the Organizational Level

The management of links on a corporate level has two general approaches: Top-down or bottom-up. In a top-down approach a central team collects the links and distributes them with a central search or link-directory. A bottom-up approach allows the end-users to add links that they deem valuable for the company or their peer-group to a central repository.

Links in Tool Databases

Every larger organization operates databases to manage the lifecycle of applications. These databases allow usually to store the link to the tool itself. Since these databases are made for the tool management, the link to the managed tool itself is usually rather a side product and the databases have no convenient interface for casual users that just want to get the link to a tool. The part of "storing" the links is partly fulfilled, but the aspect of "finding" for end-users is usually not covered. In a lucky case, the tool database is connected to the intranet server to provide a searchable list of available tools.

A second problem can arise if the managed tool itself is not a single application with one URL as entry point, but rather a platform that allows to set up dedicated resources like reports, pages or even applications. The tool database and the owner of the platform cannot manage the links to all resources at the platform.

Trying to index these platform solutions by an internal search engine to mitigate this situation creates a different class of problems: Web-based IT-Solutions are usually not designed to be "crawled" by search-engines. A crawling of a corporate IT System should rather be detected as a hacking attempt. And even if the platform allows a crawling, the crawled pages usually did not undergo a search engine optimization (SEO) process. So even if crawled and stored in an index for finding, the keywords that allow an efficient finding will most likely not be set.

Links in Intranet Pages

The most widespread approach for a link management is to run a content management system for the intranet, where the departments, domains, teams and projects can set up their own pages on which they provide links to the resources. Intranets are usually organized hierarchically and by following the path of the organization there is a good chance to find a resource.

Content management systems usually offer a search-function that indexes the pages and allows finding text on the pages. But searching for e.g. "SAP incident" might reveal hundreds of results and the first could be the yearly presentation of the SAP operations team showing how the number of incidents decreased over the year.

Problematic in this case is as well that the user does not always know which path to follow. To open an incident for an SAP problem, the user should have followed the path "/IT/systems/SAP" but he tried "/production/hamburg/tools".

Centrally Deployed Bookmarks

For very global shortcuts it is possible (depending on the setup of the IT-Infrastructure) to deploy bookmarks centrally. For a managed Chrome-Browser for instance, it is possible to deploy bookmarks to the browsers through Group Policy Objects (GPO).

By this, a central team can distribute links with well readable names to the employees. Updates of links can be distributed as well.

A special advantage of this way is that the bookmarks (at least in Chrome) are as well searched when the user types in a text to the address bar. If the central team deployed a bookmark "legal department" at the bookmark path "/mycompany/departments/legal", the browser will find this bookmark, when the user types in "legal" in the address bar.

Link Databases

To tackle the problem of tool databases that unsuitable for link-management, a common approach is to set up a link database, usually as part of the intranet. A well-designed link database fulfills all needs of a proper link management including a good rights management, aliases for links, a connection to the tool database and a convenient search function for finding the links.

Link databases cover the main needs of management for this class of links. Two problems remain:

1) The links to the entries of the link-database are still inconvenient to read and type. A link like http://www.ourintranet.corp/intra/links?id=2341112 or in a more lucky case http://www.ourintranet.corp/intra/links?link=legal is still hard to remember if read on a poster at the cantina

2) Filling out an elaborate form with tool-reference, alias, URL, department, function etc. creates a mental barrier for people who just want to have a convenient way of sharing the link to a project page.

Internal Shortcut Services

A more lightweight (and bottom up) solution for a link database that provides as well readable links, is to set up an internal shortcut service. This approach has been described by the author already in 2018

("About the usage of URL shortener in Enterprises: Mach's kurz" / iX 10/2018). The implementation consists of a standard URL-shortener (like e.g. YOURLS) that is installed as a webservice with a short and memorable DNS name like "go", "intra" or "link". A URL shortener allows to define an alias for a link. If the user calls the URL shortener with the alias, the user will be redirected to the link.

This function, combined with a certain feature of standard browsers, will create a very good user-experience: The standard browsers have the feature to add the standard domain to a raw server name typed into the address-bar. A http://go is resolved to http://go.ourintranet.corp.
If the legal department now added a shortcut with under the name "legal" to their homepage http://www.ourintranet.corp/pages/central/legal/welcome.html the use can finally type in the URL http://go/legal and he will be redirected to the homepage of the legal department.
URLs of this shortness can be easily remembered. An additional feature is that multiple aliases e.g. in different languages can be easily set up for the same target link.

This approach has been deployed very successfully in various large companies. One aspect of the successful deployment should be noted. The internal URL shortener was set up without any governance and with a "two-click interface". Every authenticated user can just call the shortcut service, enter the short-alias, an optional description and the target URL. This very low technical barrier to create a short URL supported the acceptance of the service.
Being a part of the corporate infrastructure with identifiable users, the inherent security problem of URL-shorteners to hide "evil" pages behind an innocent looking URL did not become a real threat.

There are powerful open-source URL Shorteners like YOURLS (http://www.yourls.org). The cost for running the service is the cost for a classic LAMP (Linux, Apache, MySQL/MariaDB and PHP) Stack and resources for the operational support.

Usage of Custom Browser Search Engines
The best user-experience will be created by deploying a custom search engine for the link database or even better for a shortcut service. A custom search engine with a keywork "go" that expands to the pattern http://go.ourintranet.corp/%s can be set up in the browser. The "%s" is the entered term and allows the user to simply enter "go legal" to the address-bar. Then the pattern is extended to http://go.ourintranet.corp/legal and she will be redirected to http://www.ourintranet.corp/pages/-central/legal/welcome.html. Since typing is usually faster than search and clicking, this model will be the fasted and most convenient way. (Note: For the time being the author found no GPO to deploy custom search engines).

A custom search engine solves as well the problem of heterogenous standard domains inside of an organization. If, by any reason, the shortcut-service cannot be set up in the standard domain of the end-user, the "http://go" cannot be resolved. A custom search engine will allow for users being in the domain "ourspecialintranet.corp" to use the shortcut-service at "go.ourintranet.corp" with a good user experience.

Conclusion

In the age of browser based work, the links to the applications are a corporate asset that needs to be managed. A quick and convenient availability of the all relevant URLs becomes a central lever for effective usage of computers in general. The understanding that optimization of access to electronic resources and especially URLs has the same potential as shopfloor optimization is just at its beginning.

Effective link management is not a no brainer. Organizations need to set up resources that deploy the needed solutions and drive a proper usage of the solutions for the three classes of links:

1) URLs for individual usage
2) URLs shared between users of the same domain (or team)
3) Global, organization wide URLs

For each of the classes there are available solutions to provide the needed services to organizations and end users. The available solutions are all lightweight and not cost intense

Key Takeaways

- Link management is an important task that needs to be managed and organized inside of an organization

- Employees need to have basic skills of bookmark handling for effective digital work. In case of a skill gap, dedicated training shall be offered

- Employee groups like departments or projects need "homes" for their curated link lists. Corporate solutions for the creation of group or team sites need to be available

- For easy searching and finding of corporate wide links, suitable solutions like corporate bookmarks, searchable link databases or internal shortcut services shall be centrally deployed

- The solutions for the management are not cost-intense. The intense part of an effective link management on organization level is to create awareness that link management is a substantial task to enable efficient work