**Homework for Business analyst / Technical writer:**

1. Prepare a BPMN diagram for the process that happens when you type some address in your browser’s address box (like <https://www.office.com>) and press the ‘Enter’ button.

Evaluation criteria:

* Process correctness from technical perspective
* Correctness of BPMN notation usage
* Completeness of process description
* Readability and comprehensibility
* English grammar and vocabulary
* Accuracy

1. There is a business need to choose and implement a Unified communications software solution (messaging, meetings, collaboration, etc.) in a company M across all its departments. It’s an IT company located in 10 offices, contains 2000 employees in total. As a Business/System analyst, try to prepare a list of functional and non-functional requirements that can be appropriate for such a system/solution. The initial conditions are not detailed - feel free to use your imagination.

Evaluation criteria:

* Correctness of requirement categorization (functional and non-functional requirements)
* Description completeness (requirements should describe at least all basic functionalities of Unified communications software solution and have the same level of detail)
* Document structure
* English grammar and vocabulary
* Accuracy

Please write all answers in English.

# BPMN for address box

Since it’s not specified what browser to use, below is based on my experience with Edge 88 (and earlier versions) and <https://wiki.mozilla.org/Firefox/URL_Bar_Algorithm>. Obviously, since actual algorithm is not public, this may not be as accurate as actual implemented logic.

Network portion is based on some common knowledge and <https://medium.com/expedia-group-tech/what-happens-when-i-type-something-in-the-browsers-address-bar-89a1243f0fff>. For network showing highlights for HTTP(S) only for simple page (with no external resources, let alone HTTP20 push headers) and not considering “Content-Disposition: attachment” header. Expanding handshakes and covering some edge-cases would make the diagram overloaded and take too much time (~2 full working days) compared to what I am ready to spend on a test.

Also, this is my first time ever drawing a BPMN diagram.

3 versions: bpnm (xml), svg and png.

# Unified communications software requirements

I’ve found a pretty good [paper](https://watford.moderngov.co.uk/documents/s18534/Background%20papers%20UC%20Requirements%20Questionnaire.pdf) about the subject, so used it as a baseline with some adjustments (both wording and requirements) to make it a more generalized case.

## Functional requirements

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| **Area** | **Requirement** |
| General | The solution should have a settings panel, that can allow fine-tuning of the system with saving of current settings as “Profiles” and ability to easily switch between those “Profiles” on demand. |
| The settings panel should be secure and allow access only to designated personnel. |
| The solution should provide online status of the users with optional integration with 3rd party systems like Microsoft Exchange, Lotus, etc. |
| The solution should allow both internal and external users to join voice and/or video conferences depending on both “Profile” and specific conference settings. |
| The solution must support logging of the conferences (joins, leaves, redirects, etc.), including audio/video/chat recording with search function and ability to restrict access to history (participants, participants’ managers, administrators). |
| The solution should support desktop sharing and collaboration. |
| The solution must support instant messaging between users. For internal users: even if there is no open conference line (chat-rooms). For external users: only if they have joined an open conference line. |
| Support for voice messaging with optional e-mail delivery or notification. |
| The solution must support not only sound inputs/outputs native to the device, but also software and hardware extensions. |
| Option to give managerial access to employee’s chat, conferences, and voicemail history. |
| The system, including its chat, history, user and system settings, should be accessible from both web and mobile devices, including user’s own devices. |
| Communications | The system should allow transparent call redirection, if user has set an external number (mobile) as the main call receiver. |
| There needs to be an option to transfer conference to another line. |
| The solution should support skill-based and role-based routing for external incoming calls. |
| The solution should provide interactive voice response for external incoming calls. |
| The solution should support outbound campaign calls. |
| The solution should include some integration with social media. |
| It should be possible to change the message to the call queue in real time. |
| The solution should include the option for hold music. |
| The solution must support a configuration for an out-of-hours service. |
| The system should provide a mechanism for deleting recordings after a set period. |
| It must be possible for ICT or a nominated service provider to set up hunt groups and call redirections without requiring the manufacturer/vendor’s intervention. |
| The system should provide a graphical mapping of call redirection trees. |
| The solution should allow forum-like communication board, both “public” and limited to group/department. If a specific thread is not “public”, there needs to be a feature to allow access to it through an invite. |
| The solution must have system to invite people/groups/departments (both internal and external) to scheduled events (audio/video calls, chats) with ability to track acceptance of the invite and optionally link even to existing thread/chat-room. |
| The solution must have notification system to notify users of different events: new mentions, chat messages, replies in subscribed forums/threads. |
| Chat-rooms and calls must have an option to invite administrator for assistance in case of issues. |
| System requirements | Solution should include user management system: registration and removal (or blockage) of users, both internal and external, groups. For internal users it should also include support for department, office location, job title, employee’s management line (including peers under same manager). |
| Solution should allow users to customize their subscriptions to threads/forums, profile signature, contact details and profile picture/avatar. |
| There should be functionality for monitoring performance/quality of service and identifying problem areas |
| It should be possible to integrate with the Microsoft Outlook contact details rather than a once-off import of contacts |
| The system should have its own calendar (with option to integrate it with the Microsoft Outlook calendar), which will also update the presence of a user. |
| The system must support integration with Microsoft Active Directory (ADFS or SAMLv2.0) |

## Non-Functional Requirements

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| **Area** | **Requirement** |
| General | The service provider should be able to show a history of customer satisfaction with implementation. |
| The service provider must be able to show a history of timely support during and after implementation. |
| The service provider must be able to support the product as detailed in the bid. |
| The service provider must provide Train-the-trainer training or sufficient documentation for the system. |
| The solution should provide options for users with access problems (e.g., hearing issues) to meet the Councils' obligation under the DDA (including, but not limited to speech-to-text, both online and offline). |
| The solution does not require to be web-based, but should have web interface for system management, at least. |
|  | The solution should support at least 2000 internal and 2000 external users connected to audio-calls at the same time. |
|  | Under normal conditions, there must be no distortion, or audio lag, noticeable in the calls. For video lag is allowed only in case of the system working close to its user capacity. |
| Security & Compliance | The system must meet the requirements of PCI DSS compliance, particularly regarding the storage of voice recordings involving credit card payments, if appropriate data can be found in it (optional flag in the settings). |
| The system must comply with GDPR, if deployed in country following it or dealing with users from countries following it (optional flag in the settings). |
| If the system is cloud-based by default, it should allow local storge of data in countries, where it is required by regulators. |
| The system needs to have settings for data storage, that can be easily adjusted to different regulatory standards in different countries (including encryption in storage). |
| It should be possible to determine who has listened to voice recordings and an audit trail maintained |
| The system must have clear update path for newer versions. |
| The system must have an easy to setup and manage solution to authorize and link external devices, if such linkage is required by internal processes. |
|  | The system must have an option to enforce password rules and option to force password change on next login. |
| Backup & Recovery | In the event of a network failure or disaster, the system must continue to operate or failover to the equivalent system at the DR site and continue to direct calls. |
| The solution should include or identify sufficient storage and notify administrators beforehand, if storage usage reaches a certain threshold (set in system settings). |
| It must be possible to back up (automatically and ad-hoc) the system configuration and to restore it in case of failure. |
| The solution must be resilient against the failure of any single component. |
| The solution must have clear and detailed disaster recovery plans for different types of failures. |