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ZapTurbo: a proposal to automate academic communication through personalized messages

ZapTurbo: proposta de automação da comunicação acadêmica por meio de mensagens personalizadas

ZapTurbo: propuesta para automatizar la comunicación académica a través de mensajes personalizados

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Abstract: This article presents and analyzes the development proposal for ZapTurbo, a system designed to prepare personalized messages for students at a vocational education institution. The study is applied and descriptive, with a qualitative approach based on documentary analysis of requirements, diagrams, the development schedule, and an interface prototype. The proposed solution uses a desktop application, JSON files to store message templates, and spreadsheets to insert variable information, with planned interaction through WhatsApp Web. The analysis identifies a functional workflow that may reduce repetitive tasks, while highlighting gaps concerning recipient validation, performance measurement, data security, and messaging-platform policies. The reported findings concern modeling and planning rather than a completed empirical evaluation. The study concludes that ZapTurbo may help organize academic communication routines, provided implementation is supported by documented tests, performance indicators, and compliance reviews addressing data protection legislation and the platform's current rules.

Keywords: Message automation. Academic communication. Software development. WhatsApp Web. Data protection.

Resumo: Este artigo apresenta e analisa a proposta de desenvolvimento do ZapTurbo, sistema destinado à preparação de mensagens personalizadas para estudantes de uma instituição de educação profissional. A pesquisa caracteriza-se como aplicada, descritiva e de abordagem qualitativa, baseada na análise documental dos requisitos, diagramas, cronograma e protótipo de interface. A solução projetada utiliza aplicação desktop, arquivos JSON para armazenar modelos textuais e planilhas para inserir informações variáveis, com previsão de interação com o WhatsApp Web. A análise identifica um fluxo funcional coerente com a redução de tarefas repetitivas, mas aponta lacunas relacionadas à validação de destinatários, à mensuração de desempenho, à segurança dos dados e às políticas de uso da plataforma de mensagens. Os resultados apresentados são de modelagem e planejamento, não de uma avaliação empírica concluída. Conclui-se que o projeto possui potencial de organizar rotinas de comunicação acadêmica, desde que a implementação seja acompanhada por testes, critérios de desempenho e verificação de conformidade com a legislação de proteção de dados e as regras do serviço utilizado.

Palavras-chave: Automação de mensagens. Comunicação acadêmica. Desenvolvimento de software. WhatsApp Web. Proteção de dados.

Resumen: Este artículo presenta y analiza la propuesta de desarrollo de ZapTurbo, un sistema diseñado para preparar mensajes personalizados para estudiantes de una institución de

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educación profesional. La investigación se caracteriza por ser aplicada, descriptiva y con enfoque cualitativo, basada en análisis documental de requerimientos, diagramas, cronograma y prototipo de interfaz. La solución diseñada utiliza una aplicación de escritorio, archivos JSON para almacenar modelos textuales y hojas de cálculo para insertar información variable, con posibilidad de interacción con WhatsApp Web. El análisis identifica un flujo funcional coherente con la reducción de tareas repetitivas, pero señala brechas relacionadas con la validación de destinatarios, la medición del desempeño, la seguridad de los datos y las políticas de uso de la plataforma de mensajería. Los resultados presentados provienen de modelos y planificación, no de una evaluación empírica completa. Se concluye que el proyecto tiene potencial para organizar rutinas de comunicación académica, siempre y cuando su implementación esté acompañada de pruebas, criterios de desempeño y verificación del cumplimiento de la legislación de protección de datos y de las reglas del servicio utilizado.

Palabras clave: Automatización de mensajes. Comunicación académica. Desarrollo de software. WhatsAppWeb. Protección de datos.

1. Introduction

Communication with students is part of the administrative routine of vocational education institutions and requires the processing of information related to attendance, assessments and the organization of classes. When these notifications are prepared individually, the work tends to consume time for professionals who also perform pedagogical and management activities. At Microlins, the context presented in this proposal, the sending of messages about absences, grades, notices and make-up classes was identified by the proponents as a recurring demand, subject to reorganization through digital resources.

Recent literature highlights opportunities for automation in academic support, especially when repetitive tasks are handled with standardized processes and channels accessible to students. Jezler, Scardini and Candeia (2025) relate the use of chatbots to improving the efficiency of university services, while Silva et al. (2026) discuss the role of automation in reducing communication bottlenecks in a course institution. These findings provide context for the present proposal, although ZapTurbo is not an artificial intelligence chatbot, but a system for composing and forwarding messages based on templates and spreadsheets.

ZapTurbo is designed to organize reusable textual templates, import data stored in spreadsheets, and replace variable fields with the corresponding records for each recipient. The solution described in the project material uses a desktop application, JSON files and interaction with WhatsApp Web, after checking contacts by the user. Due to privacy requirements and platform usage rules, the forwarding flow cannot be treated as unrestricted authorization for

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automated message dispatches: its eventual operation must be examined for technical, legal and contractual adequacy.

Given this scenario, the guiding question is to understand how a personalized messaging solution can make the academic communication process more organized, preserving human review and responsible processing of personal data. The objective is to present and analyze the ZapTurbo development proposal, its requirements, modeling artifacts, architecture, interface and evaluation criteria. It is not intended to demonstrate productivity gains already achieved, since the source document does not present a series of measurements before and after implementation.

2. Theoretical framework

2.1 Automation of routines and academic support

The automation of administrative tasks can promote the standardization of information and continuity of service, as long as the solution design considers users' specific needs. In a study on academic service automation, Jezler, Scardini and Candeia (2025) observed perceived benefits of a chatbot for service organization and accessibility to information. In another educational context, Gomes, Bernardi and Cordenonsi (2026) identified favorable evaluations regarding the clarity of answers, the usefulness of the service and the time savings perceived by participants in a virtual assistant evaluation.

These experiences do not mean that the results are automatically transferable to ZapTurbo. Unlike conversational solutions, capable of interpreting questions and producing answers according to a repertoire of knowledge, the system studied here depends on field-population rules, predefined models and previously verified tabular datasets. This distinction is methodologically relevant: the expected benefit is in reducing the repetition of preparation and sending operations, and not in the autonomous interpretation of academic demands. Therefore, the assessment must prioritize personalization accuracy, recipient control and operational flow performance.

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2.2 Software modeling, usability and requirements

The development of an application aimed at non-specialized employees requires a clear description of the actions necessary to perform each task and the errors that may occur during the process. Studies on interaction with educational systems point out the importance of considering the context of use, the interface and the limits of available technologies. Kuhail et al. (2023), in a systematic review of 36 works, highlight that the evaluation of educational interactions must observe design principles and evidence of functioning; this perspective reinforces the need to validate the flow and understanding of commands, even though ZapTurbo does not belong to the specific category of chatbots examined by the authors.

In the proposal analyzed, the requirements were organized around authentication, reading files, viewing data, using JSON templates, replacing markers and the possibility of canceling the procedure. These elements must be accompanied by transversal requirements, including validation of the telephone number, checking for empty fields, handling duplicates, recording failures and restricting access. The adoption of incremental Scrum and Kanban practices makes it possible to order these demands by priority and record the history of corrections, without dispensing with documented tests before institutional use.

2.3 Data protection and message channel limits

The processing of academic information requires attention to the purposes and legal bases applicable to each operation. The General Personal Data Protection Law determines the observance of principles such as necessity, adequacy, transparency and security, aspects pertinent to the handling of names, telephone numbers and student records (Brazil, 2018). Therefore, ZapTurbo planning must provide for access by authorized users, files stored in a protected manner, minimization of imported fields and retention of records only for the necessary period. Academic performance data must be communicated with special caution, avoiding undue exposure.

Messaging rules also directly interfere with the viability of the proposal. The WhatsApp Business Messaging Policy requires that business contacts have appropriate authorization to receive messages, provides for mechanisms to stop receiving messages, and restricts unauthorized communications (WhatsApp, 2026). Opening WhatsApp Web via a desktop

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application is not equivalent to contracting or approving an official integration. Therefore, before any use on a scale, the institution must evaluate a technically authorized flow, maintain confirmation of recipients and observe the platform's current documentation.

3. Material and Method

3.1 Design and context

This work is characterized as applied research, descriptive in nature and with a predominantly qualitative approach, organized as a documentary analysis of a software development proposal. The material examined brings together institutional problem, objectives, requirements, schedule, use case, sequence and implementation diagrams, as well as an interface image. The planned application unit is Microlins, with an execution period indicated from June 1st to November 25th, 2026. The document does not present a sample of users, instruments answered or observed performance values; for this reason, planning artifacts are examined, not already measured intervention results.

The analysis focused on four dimensions: coherence between the problem and objectives; coverage of functional and non-functional requirements; consistency of the flows represented in the diagrams; and feasibility of future evaluation of the system. The information was systematized from the project document, preserving the description of the desktop application and the local storage of models and spreadsheets. When security, validation or measurement gaps were identified, they were presented as recommended improvements, not as functionalities proven to be available in the illustrated version.

3.2 Development steps and validation procedures

The proposed process combines cycles of planning, implementation, testing and review, with organization of tasks on a Kanban board and periodic prioritization of most relevant items. Requirements gathering must occur with employees in charge of communications; next, the technical team organizes the use cases, defines the interface and implements import and customization routines. Each delivery must pass tests of reading files, filling in fields,

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identifying invalid records and reacting to errors. Implementation, when authorized, must occur in a controlled manner and accompanied by instructions for users.

To evaluate the effective contribution of the proposal, a comparative protocol is recommended in which equivalent tasks are performed by the manual process and the computerized process, with similar volume and complexity of records. The total time of the activity, the number of manual interventions, inconsistencies identified before sending and the frequency of failures must be measured. The perception of employees can be examined using a usability questionnaire, as long as its procedures, participants and application conditions are explained at a later stage. None of these measurements were presented as results already obtained.

Table 1 – Planned steps for the development of ZapTurbo

Step	**Main activity**	**Expected product**
1. Planning	Diagnosis and requirements gathering	Backlog and acceptance criteria
2. Modeling	Use cases, sequence and architecture	Diagrams and specification
3. Implementation	Import, JSON templates and interface	Testable Increments
4. Validation	Functional, usability and security testing	Test reports
5. Deployment	Controlled release and guidance	Deployment Log
6. Monitoring	Indicators and adjustments	Future comparative analysis

Source: Prepared by the authors (2026).

4. Results and discussion

4.1 Operational diagnosis and functional specification

The diagnosis described in the project highlights the coexistence of pedagogical and administrative tasks among the institution's employees. Updating school records, reporting absences and assessments and organizing make-up classes are activities carried out in parallel, which makes it important to reduce repeated typing and contact selection operations. The

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system proposal responds to this need by bringing together data and message templates in a preparation interface. However, the initial document does not provide statistics on the daily number of messages, hours worked or percentage of errors, which prevents estimating, at this stage, the size of the operational gain.

In the functional model presented, the user authenticates, selects the spreadsheet, informs the location of the necessary fields and checks the uploaded records. The available columns now represent replacement markers, used in the composition of individualized texts. Confirming the operation precedes opening the browser to interact with the messaging service. This sequence reveals the possibility of reusing models and reducing rework, but also highlights the importance of a human review point, as an incorrectly selected column can produce messages for the wrong people.

Table 2 – ZapTurbo requirements

Identifier	**Description and verification condition**
RF01	Authenticate and authorize only enabled users.
RF02–RF04	Select, validate, read and preview spreadsheets and their columns.
RF05–RF06	Cancel the process and save/reuse JSON message templates.
RF07 (proposed)	Check numbers, duplicates and empty fields before sending.
RNF01–RNF02	Understandable interface and measurable loading time under defined conditions.
RNF03 (revised)	Do not set an arbitrary deadline; record performance and respect platform rules.
RNF04–RNF05	Record failures and status of each operation without claiming delivery when not verifiable.
RNF06 (proposed)	Protect information and maintain traceability and access permissions.

Source: Prepared by the authors (2026).

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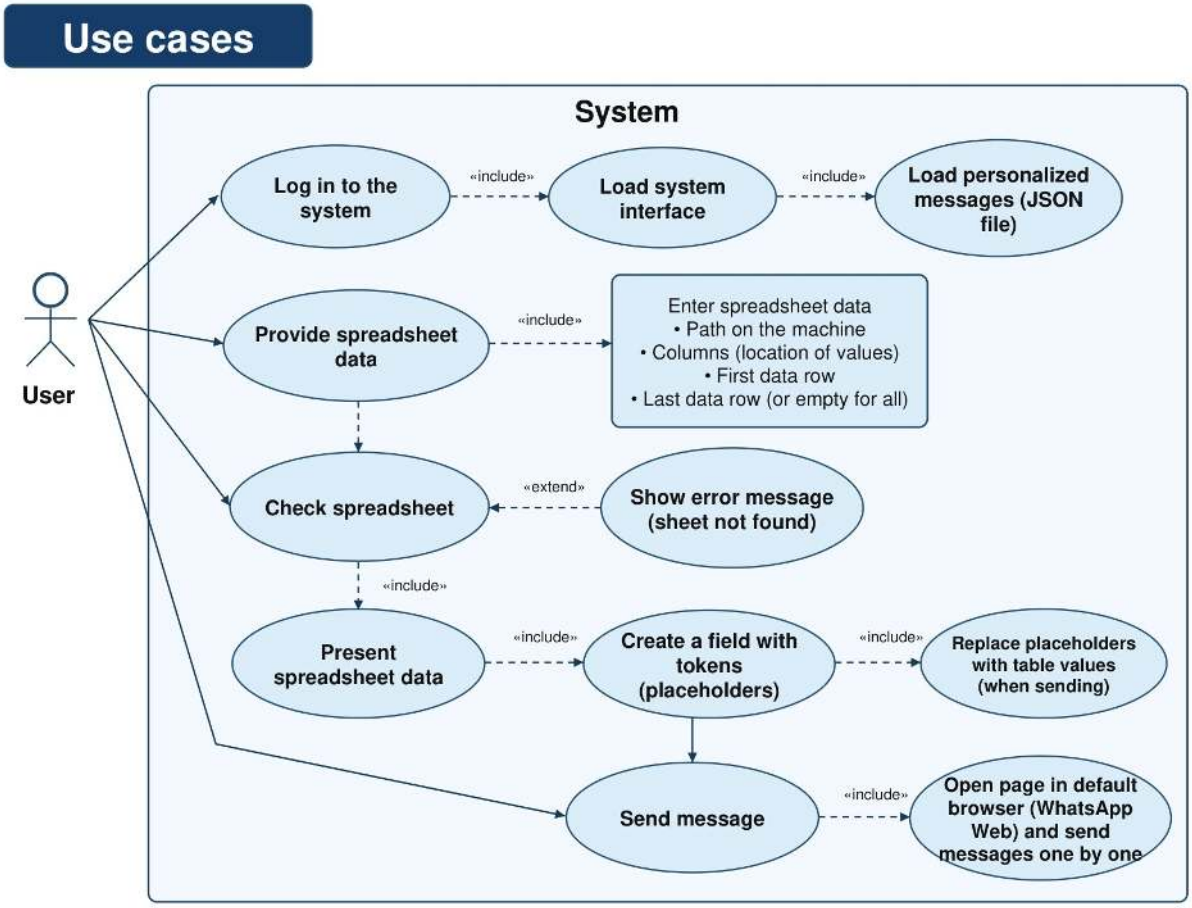
Figure 1 – Use case diagram of the proposal



Source: Prepared by the authors (2026).

4.2 Diagrams and proposed architecture

The use case diagram represents the relationship between the user and operations such as authentication, loading JSON templates, spreadsheet selection and checking, and message preparation. The sequence detailed in the project adds alternative paths for files that are found and files that are not found, in addition to illustrating the passage of information through the interface and browser. As documentation artifacts, these representations help identify dependencies and predictable failures before deployment. The scope described does not include direct integration with an institutional academic system, with the spreadsheet being the main source of records.

The deployment diagram positions the application and the JSON and spreadsheet files on the user's computer, distinguishing this environment from the browser and remote messaging service. This configuration reduces the need for its own server infrastructure for the prototype,

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although it does not eliminate device maintenance, file protection and access control. External communication occurs through the browser and depends on internet availability and the conditions of use of WhatsApp. Therefore, the effectively approved architecture must be reevaluated before expanding the operation to different sectors or units.

Table 3 – Flow phases represented in the sequence diagram

Phase	**Functional sequence**	**Control point**
Authentication	Access validation and interface initialization	Enabled user
Models	Loading saved messages in JSON	Existing and intact model
Spreadsheet	Location and validation of the reported file	Accessible file
Preparation	Reading data and creating markers	Matching fields
Review	Viewing and confirming recipients	Human review
External interaction	Opening the browser and permitted message forwarding	Channel compliance
Registration	Display of the result and any error	Verifiable state

Source: Prepared by the authors (2026).

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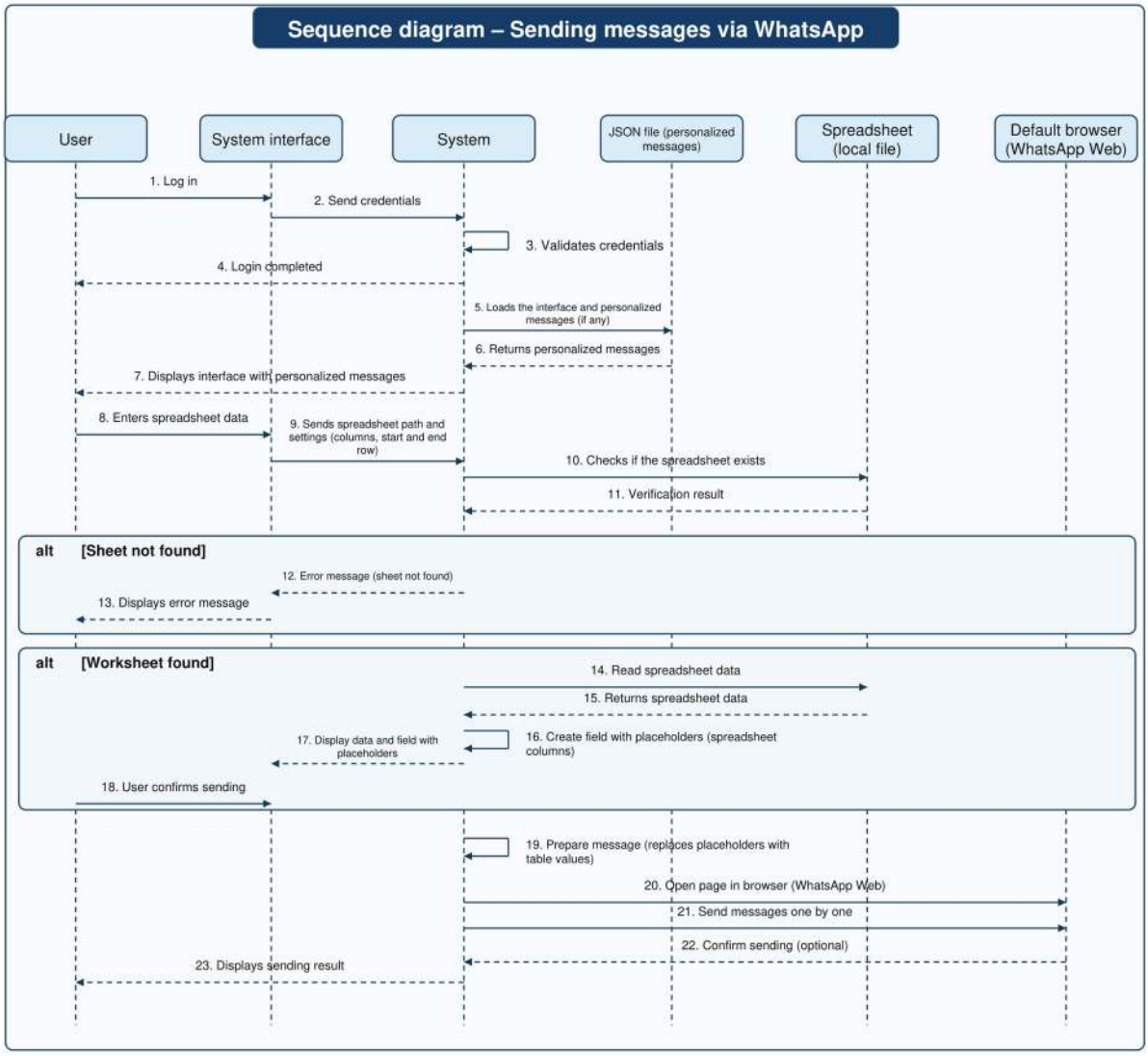
Figure 2 – Message sending sequence diagram



Source: Prepared by the authors (2026).

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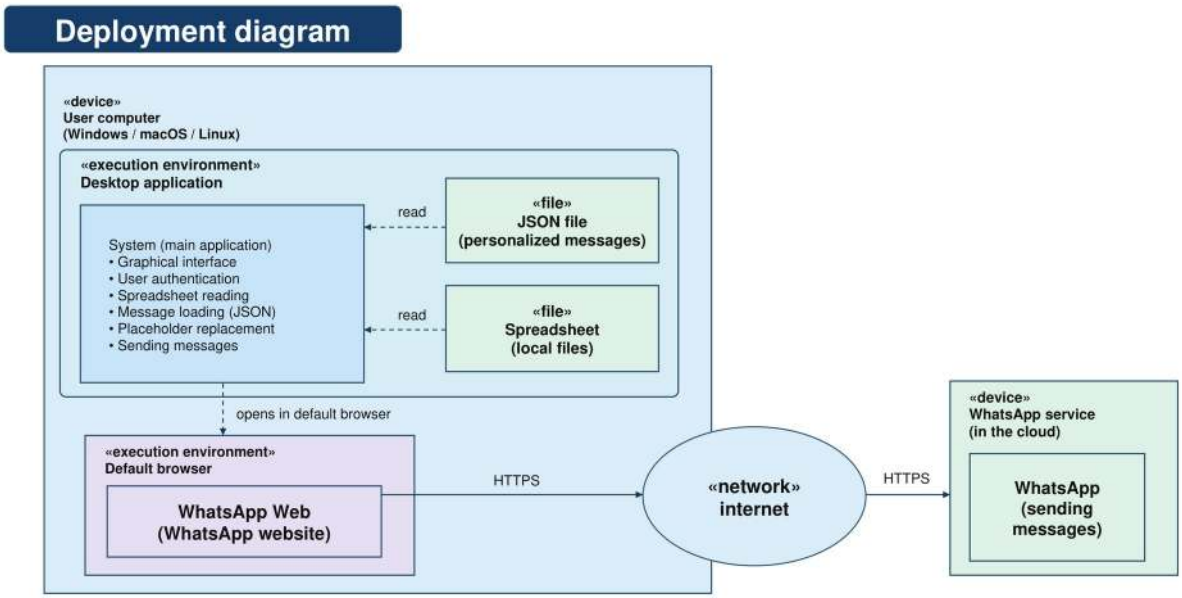
Figure 3 – System implementation diagram



Source: Prepared by the authors (2026).

Table 4 – Components represented in the ZapTurbo architecture

Component	**Function in the model**
Desktop application	Authentication, configuration and preparation of messages
Local Spreadsheet	Source of contacts and personalization data
JSON file	Storage of reusable text templates
Browser/WhatsApp Web	External communication interface provided for in the proposal
Internet/remote service	Message channel connectivity and processing

Source: Prepared by the authors (2026).

4.3 Interface prototype and interpretation of results

The image available in the documentation presents a screen called “Automatic Send”, with a list of previously named messages, fields to indicate the origin of the spreadsheet, column selection, row range, preview area and operation controls. The visual record confirms the existence of an interface representation, but it is not sufficient, in isolation, to prove full functioning of the routines or successful sending to recipients. This care of interpretation

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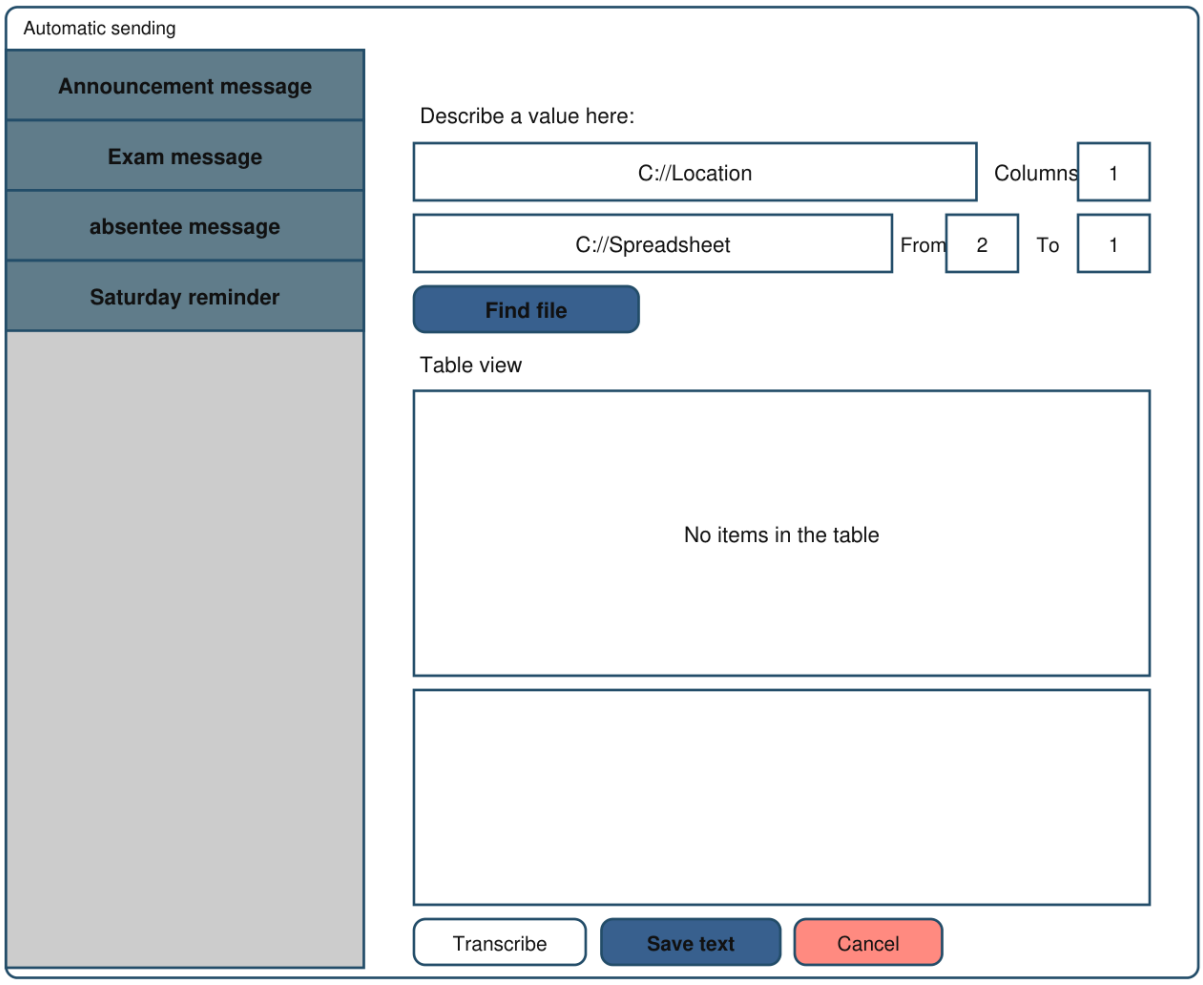
differentiates design evidence and performance evidence. The interface, however, provides elements for defining tests for clarity, consistency and error prevention.

The main risks observable in the model are related to the use of incorrect fields, the import of outdated contacts, the processing of data without adequate protection and the dependence on an external channel. The original requirement to complete the sending in a certain number of seconds cannot be used as a guarantee, because the time varies with the number of contacts, connectivity and platform restrictions. It is more appropriate to measure the preparation time and, only where there is an authorized and technically verifiable flow, the processing time and success rate. The discussion brings the operational usefulness of the solution closer to the care required for its responsible adoption.

Figure 4 – Representation of the message preparation interface



Source: Prepared by the authors (2026).

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4.4 Assessment plan and success criteria

Future evaluation should record indicators from the testing phase onward so that comparisons do not depend solely on the subjective perceptions of those involved. Median time per batch of messages, the number of invalid records, the percentage of correctly personalized messages and the proportion of canceled or interrupted operations are verifiable measures. The analysis should also consider the employee experience, including the ease of locating functions, recognizing error messages and reviewing content before forwarding. These criteria are not results already achieved, but suggested acceptance parameters based on the project objectives.

The reference schedule presented by the proponents distributes activities over six months: requirements gathering in the first, implementation in the second and third, testing in the fourth, deployment in the fifth and monitoring in the sixth. This sequence can guide project monitoring, provided that responsibilities and deliverables are specified and deployment remains conditional on approval of the tests and the compliance assessment. Actual results should be presented in a subsequent study specifying the period, number of records, procedures adopted and limitations of the analysis.

Table 5 – Proposed indicators for future evaluation

Indicator	**Suggested method of investigation**	**Interpretation**
Execution time	Time per equivalent batch, in minutes	Reduction of operational effort
Customization fix	Messages checked without incorrect field / total	Model reliability
Data inconsistencies	Records rejected due to error / total imported	Input quality
Processing failures	Operations with error / total operations	Technical stability
Perceived usability	Questionnaire applied after defined tasks	Ease of use

Source: Prepared by the authors (2026).

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Table 6 – Project reference schedule

Phase	**Expected period**	**Responsibility indicated**
Planning/ requirements	Month 1	Coordination
Development/ configuration	Months 2 and 3	Technical team
Tests and adjustments	Month 4	IT and users
Controlled deployment	Month 5	Coordination
Monitoring/ evaluation	Month 6	Management

Source: Prepared by the authors (2026).

5. Final considerations

Document analysis shows that ZapTurbo responds to a defined operational problem: the need to prepare personalized academic communications without manually repeating the same steps for different students. The artifacts gathered in the proposal allow us to understand the data import flow, the application of JSON templates and the user's participation in the information conference. The organization of requirements and diagrams supports incremental development and early identification of failures. However, the available documentation does not yet allow us to conclude that there has been a measured reduction in working time or a proven improvement in user satisfaction.

The project's central contribution lies in structuring a technological alternative that can be tested in the institution's environment. To move forward, it is recommended to strengthen error handling, standardize imported fields, protect personal records and define comparable indicators between manual and computerized execution. It will also be essential to verify the legitimacy of the messaging mechanism used, without assuming that programmatic interaction with WhatsApp Web replaces the requirements for authorized business communication solutions.

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Limitations include the lack of a quantitative diagnostic basis, the lack of systematized test results and the dependence on third-party platforms. Further research could document a pilot implementation, monitor operational indicators and analyze usability with participants identified by clear methodological criteria. In this way, ZapTurbo can stop being just a technically modeled proposal and become a solution evaluated by evidence, in conditions compatible with data protection and the real needs of academic communication.

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