

H2020 – BES – 5 – 2015

Research Innovation Action



Intelligent Portable ContROl SyStem



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D8.3 Periodic Progress Report

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1. Progress of Work Plan in the period

1.1 General progress

iCROSS project started on September 1, 2016. Six (6) WPs have started this month. Namely, WP1: Ethics requirements, WP2: Relevant EU Legislation, Requirements Analysis and Reference Architecture, WP7: Dissemination, Exploitation, Communication and WP8: Project Management and Quality Assurance. The main objectives of this first period were the extraction and analysis of user requirements (D2.1) the preparation and completion of the iCROSS Web Portal (D7.1) and the iCROSS flyer (D7.2), the submission of the Quality Management Plan (D8.1) and the Appointment of an External Ethical Advisor (D1.3). All Deliverables were submitted on time and some even a few months earlier (e.g. D7.1, D7.2). In Month 3 (November 2016) of the project, WP3 and WP4 have started as well. WP3 focuses on the development and technical test of all technological components and subsystems while WP4 focuses on the development of the iCROSS software platform and related interfaces. Furthermore, several communication/ dissemination activities were performed, for example, the preparation of the web-site and project flyer as already mentioned, the creation of a LinkedIn Group and a Twitter account, the participation in a number of workshops and events, publications and a featured article in the EU Horizon Magazine.

1.2 Progress on all work packages against initial objectives

WP 1: Ethics requirements. The main objective of this work package is to ensure compliance with the 'ethics requirements'. As border checks naturally require the processing of personal data, the technical developments of iCROSS can potentially cause complex and significant ethics issues. In order to ensure that the project follows ethic principles (Code of Ethics), properly address ethics issues and minimize the risk for individuals, the appointment of an independent Ethics Advisor was agreed by all consortium partners. The selected Ethics Advisor (EA) has the appropriate expertise in data protection, surveillance and profiling as stipulated in D1.3. The EA has been introduced to the project and is following all activities; currently being engaged to the architecture design (D2.2), which will be finally reviewed in accordance to any ethics constraints.

WP 2: Relevant EU Legislation, Requirements Analysis and Reference Architecture. This workpackage was very active during this period. Soon after the kick-off meeting the relevant work progressed quickly and the focus of activities concentrated on the extraction of the user requirements and the delivery of D2.1 – “Requirements Analysis Report”. More specifically, D2.1 activities that were carried out in the framework of this work package included the following main aspects:

a) description and analysis of concepts of border management (historical context, current practice and European perspective on Integrated Border Management) along with reviews of individual practices at the Border Control Points of the iCROSS end users: Hungarian National Police, the Latvian Border Guard and TRAINOSE (Greek Rail Border Crossing Points),

b) a thorough review of the State of the Art of all interdisciplinary technologies that will be employed within the iCROSS overall system regarding: existing border control platforms, document authenticity analytics tools, automatic deception detection systems, biometrics, hidden human detection tools, analytics, wireless communication networks. Particular attention was also given to relevant surveys and recent research in the field,

c) a specific methodology was adopted for the requirements capture and analysis to complement the state of the art review with the user perspective. This methodology was combined with specific user-centric questionnaires for the Border Guards and a relevant site survey with a practical “End User’s Workshop” which was held at the [redacted] Border Control Point [redacted]. In parallel, a Traveler’s survey took place for adequate time through an on-line (web) questionnaire accompanied with printed traveler’s awareness flyers which were disseminated at each candidate



pilot site / Border Control Point by the end users. Both the on-line traveler's questionnaire and the flyers were translated into 11 languages based on the relevant mapping of the citizens nationalities (EU and Third Country Nationals) crossing each border line. To this end, the 2nd project's consortium meeting was held in Budapest, 9-11 November 2016 combined with a visit to the [REDACTED] Border Control Point, in order to officially initiate the above surveys, to assess the relevant preliminary feedback and to provide guidance for the next steps.

d) based on all the above activities, the elicitation of the general user requirements was held; to this respect the user requirements were extracted from the Traveler's survey results, the Border Guard survey results, the Border Guard Officers and Managers interview results combined with the expertise of the participating end users.

Following the gathering and elicitation of all the above information the D2.1 was successfully delivered in due time according to the provisions of the Annex I of the Grant Agreement.

In parallel to the extraction of the user requirements, the WP2 activities are focused on the development of the iCROSS Reference Architecture (in the framework of Task 2.2 / D2.2) along with an overview of the legal and ethical framework (Task 2.3 / D2.3). The work is still ongoing following the given time plan and includes the following:

Concerning the iCROSS Reference Architecture: The definition of the functional and non-functional requirements of the main iCROSS system sections (preregistration, iCROSS platform and Border Control) and their communication interfaces along with the design of the iCROSS Reference Architecture including the envisioned scenarios, use cases, end-user functionalities and technical requirements are in progress and in line with the related work plan included in Annex I of the Grant Agreement. The design of the system architecture and its subsystem components along with their data communication mechanism is in progress as well. Based on the system analysis both functional and non-functional specifications are also being elicited, including system hardware, firmware and software also in combination to the relevant aspects of WP3 and WP4 who have been initiated as well.

Concerning the legal and ethical framework: The above actions are being made almost in parallel with the EU-wide legislation review, since the user requirements -along with legal compliance, in terms of legislation and procedures in land border control crossings (esp. in Schengen areas)- play a major role. An interaction between the functionalities of the Reference Architecture and the legal and ethical framework takes place, incorporating also the relevant aspects of WP1. Ethical issues such as privacy, informed consent and their impact on security issues, arising from the deployment and use of the activity monitoring system are constantly being identified in order to develop remedies and to guarantee an appropriate implementation.

Both the above issues are expected to be finalized in due time, according to the WP2 time plan.

WP 3: Technological Components and Subsystems Development. Partners have already started to identify the risks related to each component/module and prepare Gantt charts which are constantly updated as the work progresses. The necessary hardware sensors – cameras, scanners and other devices that will be used to capture all the necessary input are currently being identified. In parallel, an in-depth analysis of biometric sensors (i.e. fingerprints, face, iris and vein), either commercially available or in research stage, is being carried out. The analysis will also encompass state-of-the-art document authentication instruments along with the inclusion of sensors and techniques for hidden humans' detection (taking into account both the specific relevant tools already used at the Border Control and the insertion and testing of additional ones, based on the user requirements analysis). All the devices are subjected to a comprehensive SWOT analysis. Moreover, all spoofing techniques with regard to the above tools are examined and effective counter-spoofing solutions are being identified. All the subsystems involved in WP3 are already in their design phase taking into account the work already done in WP2 during the definition of the reference architecture and the user requirements.



WP 4: Development of the iCROSS software platform and related interfaces. The work so far has focused on the initial design of the iCROSS software tools and the relevant interfaces. More specifically, the work includes: the storage and retrieval infrastructure of the data collected, the risk based Assessment tool (RBAT) and the integrated automated border control analytics tool, the social interface and interfaces with external and legacy systems, the central data repository to collect the data into a single environment and the user interfaces for the border agents. Finally, an agile approach is followed as subsystems are being enriched with features based on the user requirements.

WP5 and WP6 have not started yet, according to the time plan.

WP 7: Dissemination, Exploitation, Communication. Task 7.1 and 7.2 have started at M1 to outline the project's innovation-oriented exploitation strategy and to initiate the communication activities. The iCROSS web portal was released publicly at M2 (D7.1). Additionally, the project was presented at an "End-users Workshop" in Hungary on December 2016. This workshop focused on new intelligent portable control systems for land border checks with the participation of the Hungarian project team and external experts from law enforcement, private security sector, research and academia. Moreover, the aims and core of objectives of the iCROSS project were also presented in two STEM Outreach Activities in Manchester: a) at the Fun Tech Jobs event "A series of short talks on Engineering and Computer Science, designed to Inspire, Educate and Engage" and b) to the Levensulme Girls High School in Manchester in a short talk regarding "Artificial Intelligence, Artificial Neural Networks". Furthermore, a featured Article about iCROSS: "Avatar interviews and portable scanners to speed up border crossings" was published by the EU Research & Innovation Magazine on February 2017. Within the dissemination activities, two scientific publications (one at the online journal ZD-Aktuell and an accepted paper to be soon announced at the 11th EUCAP Conference, Paris, March 2017) should also be mentioned despite the fact that the project is still on its early development stages. Finally, the project flyer was released early at M2 as the output of D7.2.

WP 8: Project Management and Quality assurance. Project and technical management at this period were very intense to initiate an effective coordination of the project teams, to integrate the initial plans and to settle the appropriate basis for the technical work evolution. The kick-off meeting in Athens and a workshop in Budapest (2nd consortium meeting, as already mentioned in WP2) were organized and minutes and actions plans were derived and monitored. The work within WP1 also included the development of the D8.1 – "Quality Management plan" where several progress KPIs were identified as well as all the initial actions to put the project to work; including the organization of teleconferences with initial tasks, financial arrangements and payments, preparation of document templates and the installation of a project collaboration space in Alfresco located at ED premises.

Project physical meetings during this period			
Place	Dates	Type	Participants
Hotel Aquamarina, Mati, Attikis, Greece	12-13 September 2016	Kick-off meeting	ALL
HNP Budapest, Hungary	9-11 November 2016	Workshop at pilot site	ALL

1.3 Identified deviations, problems and corrective actions taken in the period

On November 2016, the Polish Border Guards partners decided to withdraw from the iCROSS contract, due to fundamental structural and organisational changes. Since then, several governmental authorities have been contacted which were considered as a good substitute of the Polish authority, in

terms of being European/ Schengen member state that has common borderline with a non-Schengen country, in order to suit the description of the initial topic. Following several contacts with some authorities, the consortium finally concluded on inviting KEMEA.

KEMEA (Center for Security Studies), is a Hellenic entity operating within the Hellenic Ministry of Interior and Administrative Reconstruction, acting as the interface for all Greek Law Enforcement Agencies. KEMEA has responded positively, will define and implement a scenario that will meet the expectations described for the Polish one, and will also support and assist the TRAINOSE scenario, to overcome any constraints as TRAINOSE is a railway company and has limited authority on the border guards. Following the aforementioned, the consortium has officially invited KEMEA to act as a full beneficiary of the iCROSS project, and subsequently, will proceed with the GA and CA agreements amendments.

1.4 Progress regarding performance indicators

An initial table of Key Performance Indicators has been compiled and included in deliverable D8.1 in M3. The performance assessment based on those KPIs will be conducted in subsequent periods.

WP – Activities	Performance Indicator	Framework for Metrics	Target Values
WP1 – Ethics requirements	1-1 Ensure compliance with the ethics requirements	1-1-1 Advice from an external Ethical Advisor	Target: Positive (on going process) <u>Achieved up to M6:</u> Ethical Advisor successfully appointed
	1-3 Minimise risks of stigmatization of individuals and groups	1-3-1 Request of full consent from people involved in piloting. Mitigation plan to be included in D2.3, according to international and European legislation	≥ 90% full consents. Zero deviation from the mitigation plan <u>Correction:</u> 100% full consent. Zero deviation from the mitigation plan <u>Achieved up to M6 activities (surveys, etc.):</u> 100%
WP2 –Relevant EU Legislation, Requirement Analyses and Reference Architecture	2-1 Ensure proper understanding of the user needs at border crossing points	2-1-1 Usage of effective means to address the user groups (questionnaires, interviews etc).	Target :≥ 60% total responses in respect to the various users addressed. <u>Achieved:</u> 100%
	2-2 Ensure extraction of adequate (functional and non-functional) user requirements and formulation of the consequent use case scenarios.	2-2-1 Comprehensive and in depth related qualitative and quantitative analysis according to predefined methodology. Assess consistency of scenarios among the involved border crossing points.	Target: Feasibility and tangibility of user requirements and scenarios mapping. Positive feedback from the end-users. <u>Achieved:</u> 100%
WP7– Dissemination, Exploitation, Communication	7-1 Effectiveness and Impact of Dissemination activities	7-1-1 Visibility of the public iCROSS website	Target: Approximately 500 visitors per year <u>Achieved up to M6:</u> 2102 unique visitors
		7-1-2 Number of written and electronic publications (in academic and technical media)	Target (overall): ≥ 5 <u>Achieved up to M6:</u> 1
		7-1-3 Number of written and	Target: ≥ 3 per year

		electronic publications (in industrial, business and public media)	<u>Achieved up to M6: 1</u>
		7-1-4 Number of website / newsletter articles via partner's channel	Target: ≥ 5 per year <u>Achieved up to M6: 5</u>
		7-1-5 Number of presentations (in symposiums, meetings, congresses)	≥ 6 <u>Achieved up to M6: 3</u>
		7-1-6 Number of Project workshops	Target: ≥ 1 <u>Achieved up to M6: 1</u>
		7-1-7 Number of followers on Twitter	Target: ≥ 50 per year <u>Achieved up to M6: 14</u>
		7-1-8-Number of followers on LinkedIn	Target: ≥ 50 <u>Achieved up to M6: 31</u>
		7-1-9 Number of publications on LinkedIn	Target: ≥ 5 per year <u>Achieved up to M6: 8</u>
WP8 – Project Management and Quality Assurance	8-1 On time submission of deliverables	8-1-1 In time project progress: Number of deliverables submitted on time	Target: $\geq 80\%$ <u>Achieved up to M6: 100%</u>

2. Deliverables

Del. N°	Deliverable name	Lead Beneficiary	Type/ dissemination level	WP N°	Delivery date from Annex I	Delivered (yes/no) and status (draft/final)	Forecasted delivery date	Comments on progress
D1.3	Ethics Advisor	ED	CO	1	30 November 2016	YES, final		
D2.1	Requirement Analysis Report	MMU	CO	2	30 December 2016	YES, final		
D7.1	Project Web Portal	ED	CO	7	30 November 2016	YES, final		
D7.2	Project flyer	ED	CO	7	28 February 2017	YES, final		
D8.1	Quality Management Plan	ED	CO	8	30 November 2016	YES, final		

3. Milestones

Milestone N°	Milestone Title	Related WP N°	Lead Beneficiary	Delivery date from Annex I	Achieved (yes/no)	Forecasted achievement date (if not achieved)	Comments on progress
MS1	Reference Architecture	2	ICCS	(M8) 28 April 2017	In progress	Expected to be delivered	The design of the reference

	and components specifications					in due time.	architecture and the components technical and functional specifications is presently on the right track. Minor delays due to the system's complexity are at the moment absorbed adequately.
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4. Critical Implementation Risks and Mitigation actions

4.1 Foreseen Risks (risks already identified prior the initiation of the project, see Annex 1)

Risk N°	Description of Risk	Related WP N°	Proposed risk-mitigation measures
R3	Difficulty in collecting and analysing end-users requirements	2	The detailed methodology developed during Task 2.1 thoroughly described how to collect and analyse the relevant data. Partner's expertise was a major factor to overcome this risk. Therefore, no major issue has occurred.
R4	Requirements of the pilot users are not aligned	2	The border control officers have addressed similar problems. No significant issues occurred.

4.2 Unforeseen Risks

Risk N°	Description of Risk	Related WP N°	Proposed risk-mitigation measures
UR5	Not enough answers to the online questionnaire in the set time frame	2	More survey leaflets were printed and distributed at the borders. A short extension in the time frame was given to gather more answers.
UR6	Due to the system's complexity, a small delay to the architecture design may be observed.	2	All partners are cooperating and communicating with frequent telcos in order to avoid any possible delay regarding the submission of the D2.2. An architecture physical workshop with involved partners has been scheduled in M7, to assure the progress of the design of the reference architecture and the editing of the respective deliverable.

5. Work plan for the next period

5.1 Planned activities in the next period

WP 1: The ethics of profiling and the risk of stigmatization of individuals and groups will be addressed in the context of WP2 and linked to the possibility of false positives. Furthermore, an appropriate mitigation plan will be included in D2.2.

WP 2: The reference architecture and components specifications are going to be finalized and submitted (D2.2), taking under consideration outcomes of D2.1, and running in parallel with the EU-wide legal and ethical review report (D2.3). This WP is scheduled in Annex I of the Grant Agreement to finish at month 8 of the project. The reference functional designs and respective specifications for each architectural component, define the specifications of the system components to be developed in subsequent WPs, and especially in WP3 and WP4.

WP 3: Next steps include the finalization of the data collection devices definition and continuing with the process of technological components and subsystems development. This will enable the creation of a very early version of each iCROSS component. During this process, any unforeseen issues will be detected as early as possible and in parallel provide useful capability insights. A unit test plan for each subsystem will be defined in order to guarantee the performance of the different components in the system.

WP 4: The development of the iCROSS software tools and relevant interfaces will continue. An agile development approach where new features can be added gradually will be adopted, in parallel with the validation of correct operation and complete system debugging.

WP7: The partners will begin the process of identifying stakeholders related to iCROSS exploitable outcomes and will establish links and communication with them to gather market requirements and additional insights on the commercial viability of the various routes to market. Efforts will also be made to start getting traction on social media with targeted campaigns to various stakeholders, and to achieve widespread dissemination via media and advanced academic publications (D7.3). The analysis of an early business plan (D7.4) will also start in order to identify where iCROSS differs from existing border control platforms and the way to strengthen its position in the market. All partners and especially the universities, have already started to investigate future events (conferences, paper publications) where the iCROSS project and corresponding research and activities could be presented.

WP8: The coordinator and corresponding partners will continue to effectively monitor the project in administrative, technical and financial terms, to ensure its strategic and everyday management, and to guarantee the adherence of the work to the overall project plans, available resources and timing.

5.2 Planned meetings, activities related to market uptake and dissemination activities

Frequent meetings and telcos are planned at various levels to monitor the project and ensure that the progress is well monitored.

At the initial stage of the project, a research on dissemination opportunities was carried out by ITTI. As a consequence, a list of journals and conferences whose scope overlaps with iCROSS research was distributed among partners. What is more, it has been planned to prepare a joint paper on iCROSS innovations and present it at one of the three below enlisted conferences:

- 1st International Conference on Security, Privacy, and Trust (INSERT'17) held on 3-6 September, 2017 in Prague, Czech Republic;
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- 2017 International Conference of the Biometrics Special Interest Group (BIOSIG) held on 20-22 September, 2017 in Darmstadt, Germany;
- 12th Future Security held on 26-28 September, 2017 in Nürnberg, Germany.

The realistic scenario is to aim at the conference in Darmstadt. The conference seems to be the closest to the iCROSS research objectives. The conference will touch upon such topics as the use of biometrics in various fields, multimodal solutions, and portable tools. Therefore, the event may be not only a perfect opportunity for iCROSS partners to promote project solutions but also it might be a venue for collection of valuable feedback and evaluation of market pull for proposed solutions. Nevertheless, more details on the event should be available in the next report.

Moreover, iCROSS project representatives are invited to present the iCROSS concept and outcomes during the FRONTEX workshop for research projects, being held in Warsaw, Poland, 8th June 2017.

iCROSS project has also been invited to present the main objective of the project and the progress made in the first year since its official start at the EAB-Research Project Conference 2017 (co-located with the EAB Research Award and the IEEE BIOSIG Conference, hosted by Fraunhofer IGD, Darmstadt, Germany, 18-19 September 2017); the European Association for Biometrics (EAB) in collaboration with the European Commission Joint Research Centre (JRC) organize this event to present research results and discuss the benefit of biometrics for our European society.

In addition, an article is being prepared with aim to be submitted to the Elsevier monthly journal 'Biometric Technology Today' for the April 2017 issue. This journal covers the latest trends in the development and use of biometric technology and ED, MMU, ITTI and HNP are collaboratively working to submit an article based on the iCROSS outcomes so far.

6. Dissemination and exploitation of results

6.1 Scientific Publications

Type of scientific publication (journal/conference proceedings/workshops/book/monograph/thesis/dissertation/etc.	Title of scientific publication	ISSN or eISSN	Authors	Title of journal or equivalent	Number of issue, date	Publisher	Place of publication	Year of publication	Relevant pages	Peer review	Is/Will open access provided
(Online)-Journal	Europäischer Grenzschutz 2.0 – Ein Überblick über datenschutzrechtliche	2192-5593	Jonathan Stoklas	ZD-Aktuell	Heft 21, 16.12.2016	Beck	Munich	2016	ZD-Aktuell 2016, 05418	no	no

Herausforderungen											
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6.2 Progress regarding market uptake and exploitation

The work on market uptake and exploitation has just started, with the identification of stakeholders related to iCROSS exploitable outcomes the drafting of an early business plan (D7.4) to identify where iCROSS differs from existing border control platforms and the way to strengthen its position in the market.

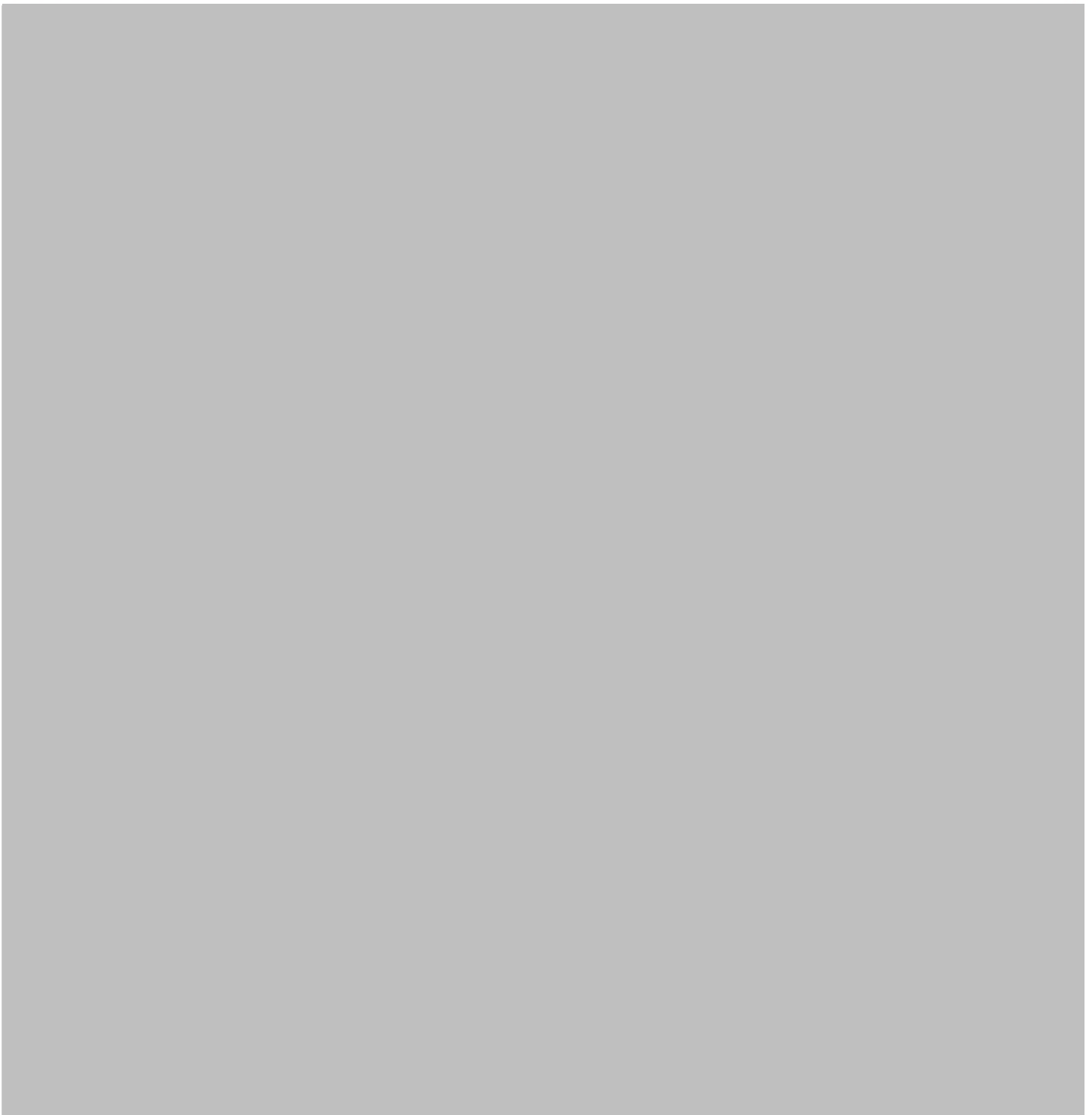
6.3 Dissemination and Communication activities

Type of communication and dissemination activities	Number of activities
On 14th December 2016, an iCROSS end-user workshop on new intelligent portable control systems for land border checks was held with the participation of the Hungarian project team and external experts from law enforcement, private security sector, research and academia.	1
<p>iCROSS Dissemination as part of STEM Outreach Activities</p> <p>1) 5th December 2016, iCROSS presentation of the aims and core of objectives of the projects to a wide and varied audience at the event Fun Tech Jobs - A series of short talks on Engineering and Computer Science, designed to Inspire, Educate and Engage! The overview of the traveller's pre-registration system was well received and was followed by a discussion of the ethical and social use of artificial intelligence to detect deception. The event was sponsored by the School of Computing, Mathematics & Digital Technology at Manchester Metropolitan University, IEEE Women in Engineering United Kingdom and Ireland, and IEEE Women in Computational Intelligence.</p> <p>2) 15th December 2016, short talk on Artificial Intelligence, Artificial Neural Networks and the iCROSS application to pupils aged 11 - 14 at Levensulme Girls High School in Manchester (United Kingdom). The pupils asked many questions about how the iCROSS Pre-Travellers system would work, especially for Schengen and Non-Schengen countries. The majority had experienced European travel and they felt that anything to speed things up at borders would be very good.</p>	2
Featured Article about iCROSS: "Avatar interviews and	1



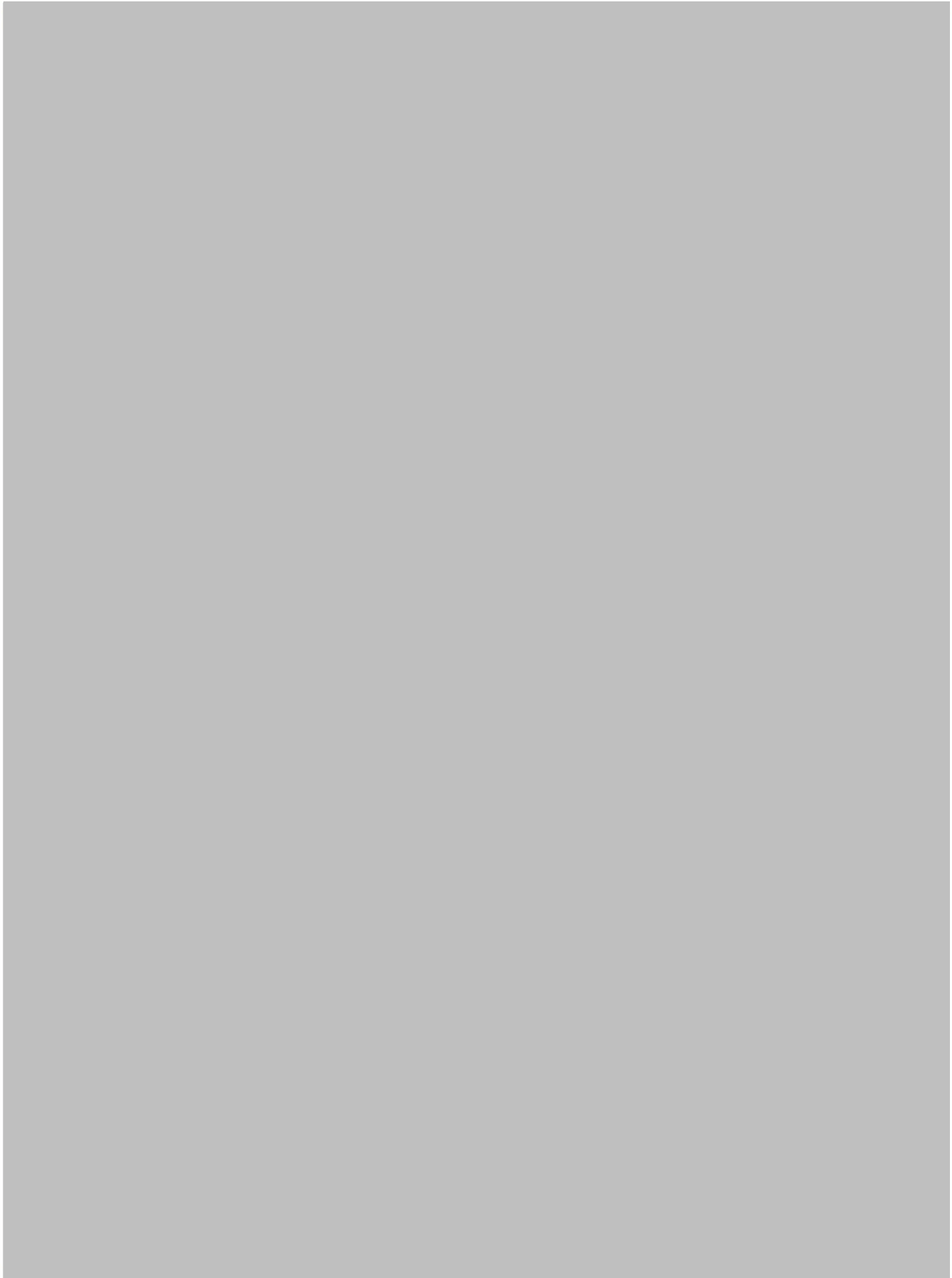
portable scanners to speed up border crossings" in the EU Research & Innovation Magazine (8th of February 2017). https://horizon-magazine.eu/article/avatar-interviews-and-portable-scanners-speed-border-crossings_en.html

7. Overview on use of resources



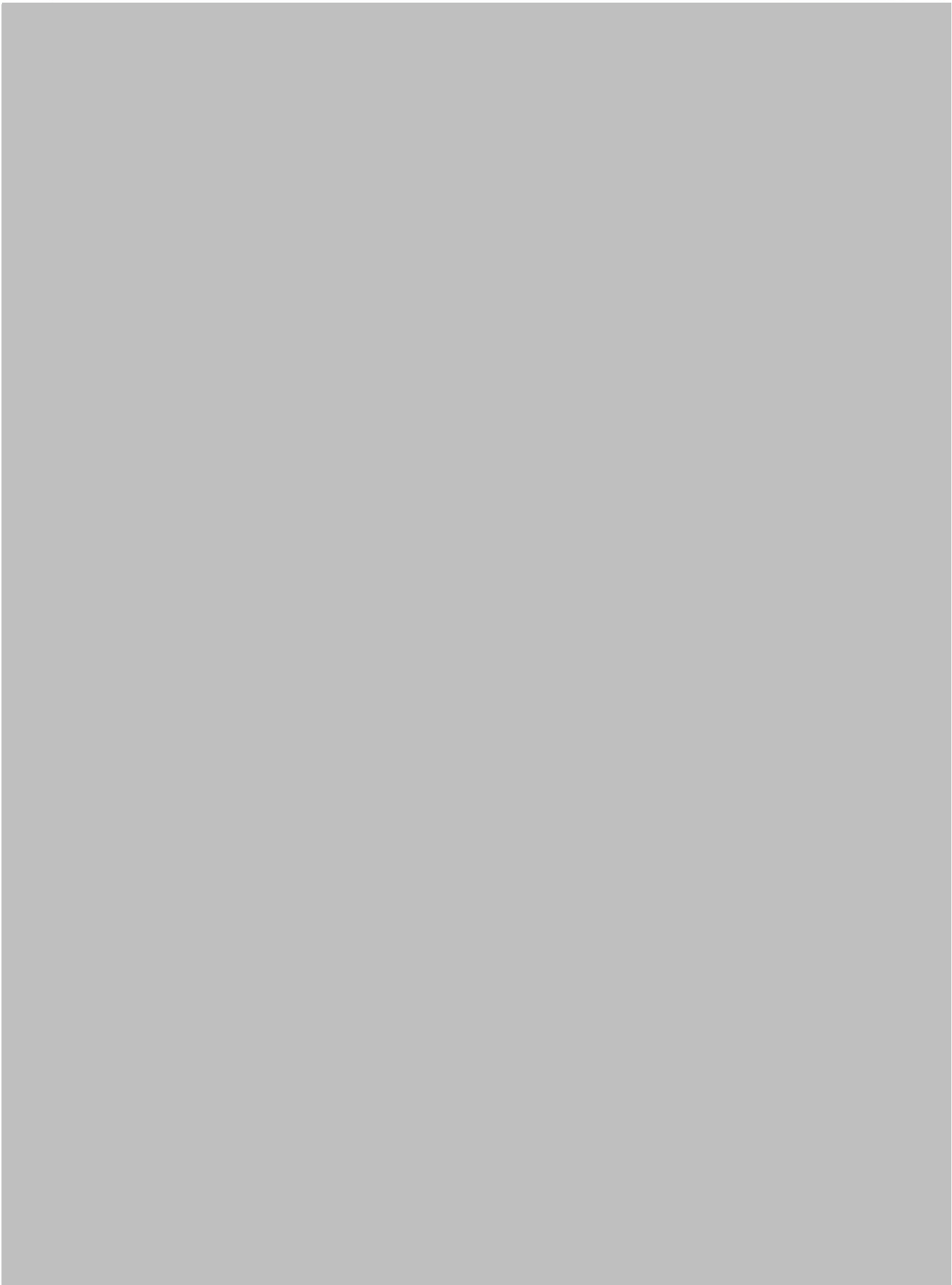


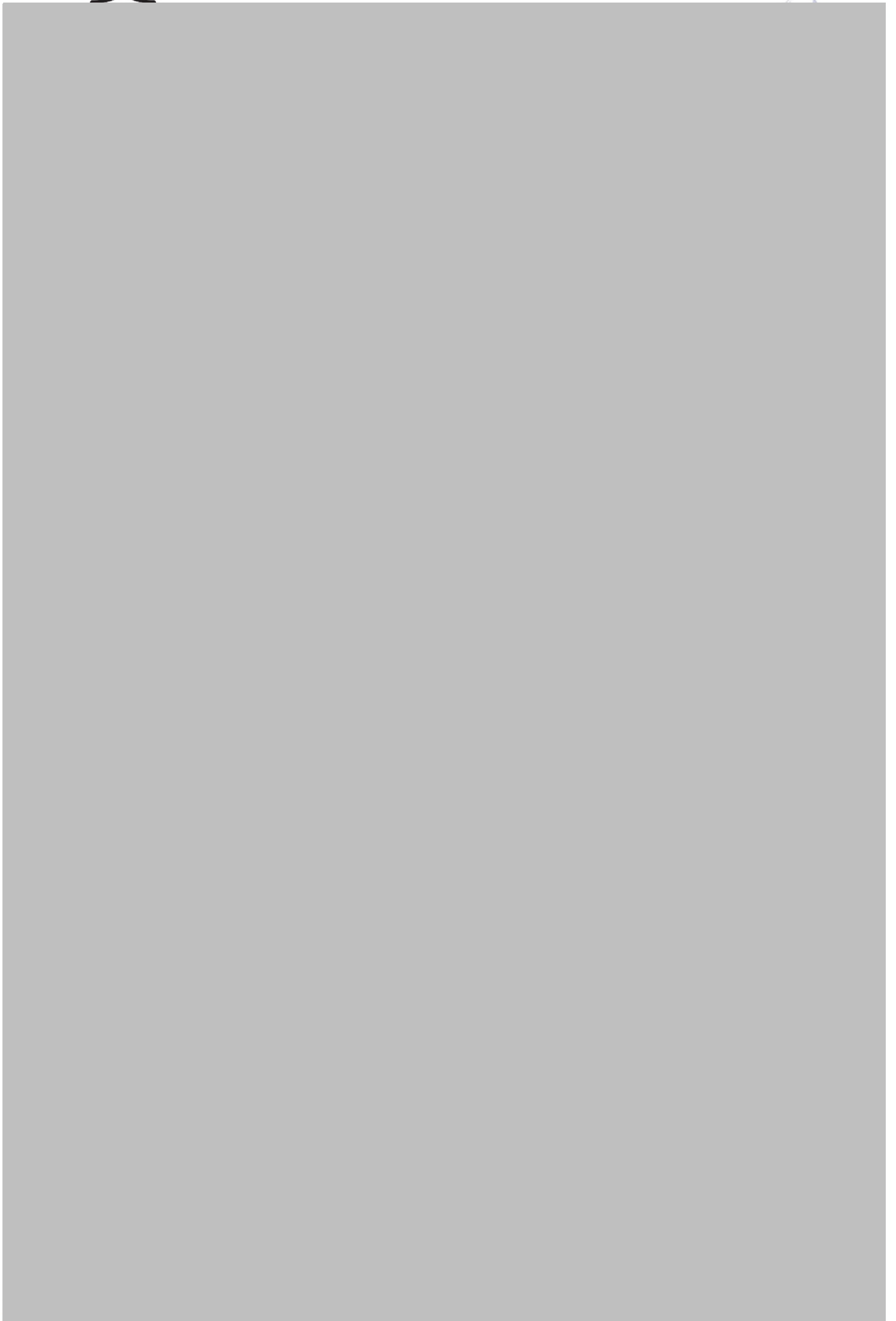
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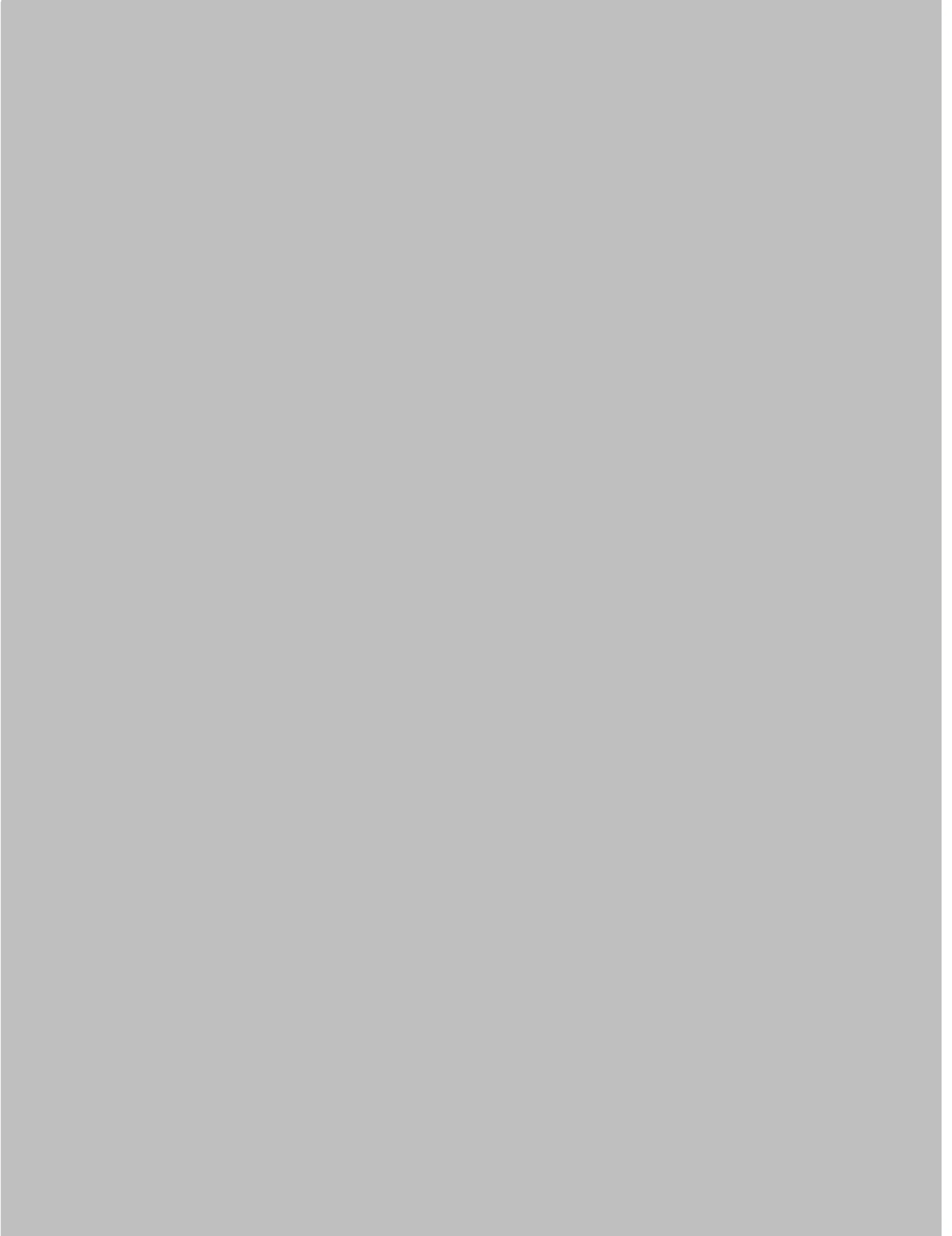
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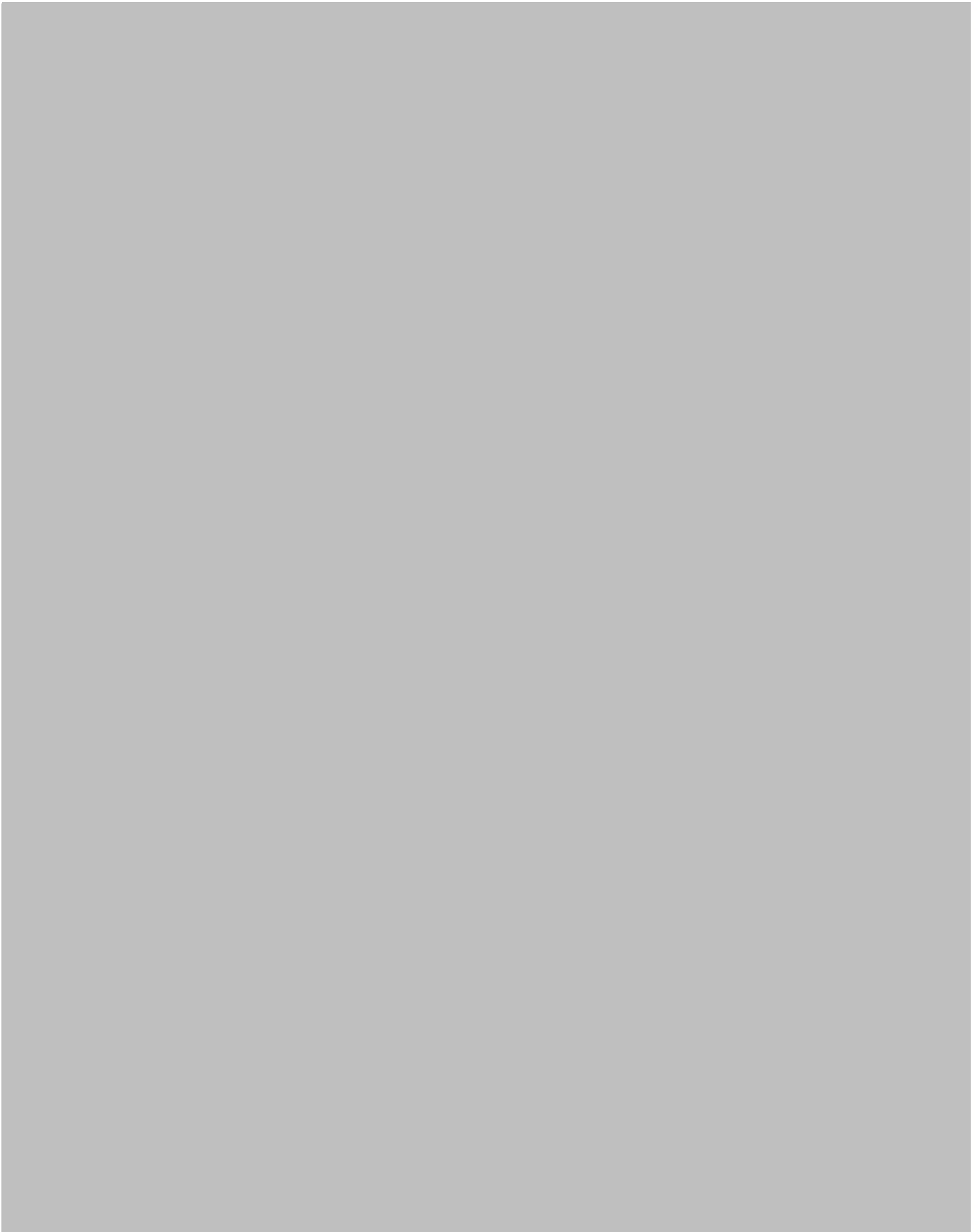


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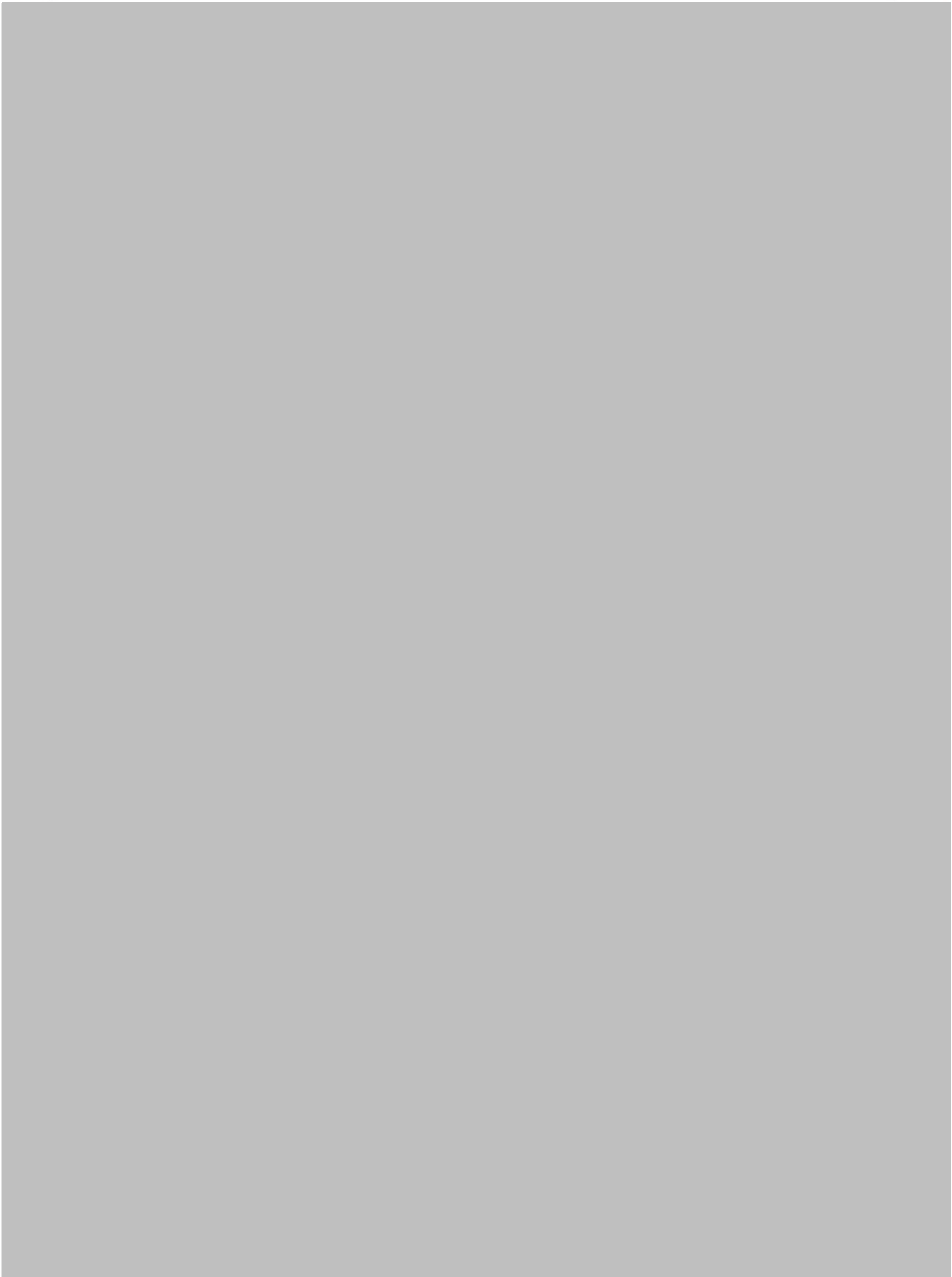


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