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- PATENT -
- Atty. Dkt. 0867/50841 -

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Eric R. Hamilton
Title:	COMPUTER ASSISTED INSTRUCTIONAL DELIVERY SYSTEM
Serial No.:	07/510,141
Filed:	April 17, 1990
Examiner:	D. Crosby
Art Unit:	3302

I hereby certify that this paper is being deposited with the United States Postal Service as Express Mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on this date.

Robert Smith

Date
MAY 20, 1992

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AMENDMENT B
AFTER FINAL REJECTION

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

Dear Sir:

This communication is responsive to the Office Action dated February 20, 1992, concerning the above-referenced application.

Please amend the application as follows:

In the Specification:

Please refer to the Substitute Specification (without claims) enclosed with this Amendment. In addition to those changes listed in Amendment A, mailed August 5, 1991, the following changes have already been incorporated into the Substitute Specification (page and line numbers corresponding to original Specification):

Page 6, line 9, change "Fig. 1" to --Figure 1--;

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Page 6, line 11, change "Fig. 2 is an overall" to
--Figures 2A-2C represent an overall--;

Page 6, line 16, change "Fig. 3A" to --Figure 3A--;

Page 6, line 23, change "Figures 5A and 5B" to
--Figures 5A-5C--;

Page 6, line 26, change "Figure 6 depicts" to
--Figures 6A-6B depict--;

Page 6, line 32, change "Figure 8 depicts" to
--Figures 8A-8B depict--;

Page 8, line 2, change "Fig. 1" to --Figure 1--;

Page 9, line 11, change "Figure 2," to
--Figures 2A-2C,--;

Page 9, line 11, change "provides" to --provide--;

Page 9, line 26, change "Figure 2)" to
--Figure 2A)--;

Page 11, line 1, after "(104)" insert --)--;

Page 11, line 5, change "Fig. 2 more fully depicts" to
--Figures 2A-2C more fully depict--;

Page 11, line 6, change "Figure 2," to
--Figures 2A-2C,--;

Page 13, line 3, change "Figure 2 depicts" to
--Figures 2A-2C depict--;

Page 14, line 5, insert a comma after "Inc."

Page 15, line 16, change "(Fig. 7" to --(Figure 7--;

Page 15, line 28, change "Fig. 5 depicts" to
--Figures 5A-5C--depict--;

Page 16, line 4, change "311" to --311B--;

Page 16, line 11, change "328" to --328C--;

Page 16, line 11, change "327" to --327C--;

Page 16, line 13, change "395" to --395D--;

Page 16, line 13, change "396" to --396D--;

Page 16, line 18, change "Figure 6)" to
--Figures 6A-6B),--;

Page 17, line 3, change "Figure 6 notes," to
--Figures 6A-6B note,--;

Page 17, line 11, change "308" to --308A--;

Page 17, line 11, change "323" to --323A--;

Page 17, line 11, change "325" to --325A--;

Page 17, line 11, change "350" to --350A--;

Page 17, line 13, change "300" to --300A--;

Page 17, line 17, change "326" to --326B--;

Page 17, line 17, change "330" to --330B--;

Page 17, line 18, change "324" to --324B--;

Page 17, line 18, change "331" to --331B--;

Page 17, line 18, change "In" to --in--;

Page 17, line 19, change "329" to --329B--;

Page 17, line 22, change "checknet" to --check_net--;

Page 17, line 22, change "Figure 5)" to
--Figures 5A-5C)--;

Page 17, line 29, change "397-399" to --397-398--;

Page 18, line 6, change "Figure 2," to --Figure 2A,--;

Page 18, line 10, change "simply" to --simplify--;

Page 19, line 10, change "443" to --443A--;

Page 19, line 11, change "400" to --400A--;

Page 19, line 19, change "Figure 2)." to --Figure 2A).--;

Page 20, line 13, change "bottom" to --button--;

Page 21, line 3, delete new paragraph indent before "(Figures";

Page 21, line 3, change "(Figures" to --Figures--;

Page 21, line 5, change "469" to --469C--;

Page 21, line 5, change "444" to --444C--;

Page 21, line 6, change "442" to --442D--;

Page 21, line 6, change "441" to --441D--;

Page 21, line 15, change "Figure 6)," to --Figures 6A-6B),--;

Page 21, line 18, change "checknet" to --check_net--;

Page 21, line 19, change "Figures 5A and 5B," to --Figures 5A-5C,--;

Page 21, line 26, change "446 through 468" to --445 through 446, 448 through 449, 451 through 468--;

Page 21, line 27, change "Figures 5A and 5B" to --Figures 5A-5C--;

Page 21, line 28, change "checknet" to --check_net--;

Page 21, line 29, change "Checknet" to --The check_net function--;

Page 22, line 6, change "checknet" to --check_net--;

Page 22, line 8, change "Checknet" to
--The check_net function--;

Page 22, line 22, change "Checknet" to
--The check_net function--;

Page 23, line 10, change "(532A" to --(Path 532A--;

Page 23, line 11, change "(562)" to
--(515B) where the exit path continues to off-page connector 539B in Figure 5C, leading to a return (562).--;

Page 23, line 12, change "(515 in Figure 5A and 539 in Figure 5B.)" to
--515B in Figure 5B and 539B in Figure 5C--;

Page 23, line 12, after "Figure 5B.)" insert --)--;

Page 23, line 15, change "Figures 5A and 5B" to
--Figures 5A-5C--;

Page 23, line 25, change "checknet" to --check_net--;

Page 24, line 9, change "539" to
--513, leading to connector 515B, where the exit path continues to connector 539B in Figure 5C, leading to a return (562).--;

Page 24, line 15, change "onto to" to --onto--;

Page 25, line 1, change "teacher" to --teacher's--;

Page 25, line 17, change "Figure 6" to --Figure 6A--;

Page 25, line 18, change "(554 in" to --554C in--;

Page 25, line 19, change "Figure 5A and 555 in Figure 5B)" to --Figure 5B and 555C in Figure 5C--;

Page 28, line 1, change "Figures 5A and 5B," to --Figures 5A-5C,--;

Page 28, line 4, change "530 through 553" to --530 through 538, 540 through 553--;

Page 28, line 5, begin a new paragraph before "Figure 6";

Page 28, line 5, change "Figure 6 diagrams" to --Figures 6A-6B diagram--;

Page 29, line 4, change "checknet" to --check_net--;

Page 29, line 4, change "Figure 5)" to --Figures 5A-5C)--;

Page 29, line 14, change "checknet" to --check_net--;

Page 29, line 15, change "Figure 5B" to --Figure 5C--;

Page 29, line 20, change "checknet" to --check_net--;

Page 30, line 3, change "checknet" to --check_net--;

Page 30, line 16, change "checknet" to --check_net--;

Page 30, line 20, change "651 through 668" to --651 through 663B, 665A, 665B, 667A, and 667B--;

Page 30, line 24, begin a new paragraph before "Figure 7";

Page 30, line 26, change "(p." to --(page--;

Page 32, line 4, change "i.e." to --i.e.,--;

Page 32, line 18, change "Figure 8 diagrams" to --Figures 8A-8B diagram--;

Page 33, lines 16-17, change "On-page connector A (823)" to --Off-page connector 823A--;

Page 33, line 28, change "Figure 8" to

--Figures 8A-8B--.

In the Claims:

Please amend the claims as follows:

Claim 1. (Twice Amended) A computer assisted [instructional] electronic information [delivery] communication system comprising:

at least two stations;

at least two monitor means, one associated with each of said two stations, for displaying [instructional] electronic information in visual form;

at least two input means, one associated with each of said two stations, for entering said electronic [handwritten instructional] information in handwritten freehand form to display on at least its associated monitor means; and

communication means for virtually simultaneously transmitting [instructional] said electronic information being entered simultaneously at either of said two input means from either station to the other station, and for enabling the virtually [simultaneously displaying] simultaneous display of said transmitted [instructional] information on both of said monitor means associated with both of said stations such that electronic information being entered at a first input means appears on both of said monitor means at substantially the same time while under the independent control of said first input means.

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Claim 2. (Once Amended) The system of Claim 1, wherein one of said stations is adapted for an instructor and ~~one or more~~ the other of said stations are adapted for students.

Claim 4. (Twice Amended) The system of Claim 2, wherein said communication means selectively affords said instructor's station to selectively view [instructional] said electronic information displayed at any of said ~~monitor~~ means at any of said students' stations virtually simultaneously to the time said information is being handwritten at said students' stations.

Claim 8. (Twice Amended) A computer assisted [instructional] electronic information [delivery] communication system, comprising:

at least two stations, each of said stations having:

at least one monitor having a display surface on which an image appears;

input means for inputting [instructional] electronic information in graphical form into said monitor by a user drawing or writing directly on said display surface;

peripheral interface means for accepting [the instructional] said electronic information from said input means and for providing [instructional] image information to said monitor;

central processing unit means for controlling said peripheral interface means; and

said electronic information communication system further comprising:

communication network means for communicating information in real time between the peripheral interface means of each of said two stations in order to virtually simultaneously display the [instructional] electronic information being input independently and simultaneously [on said monitors] by said input means at either of said two stations such that substantially the same image is displayed on the monitors of both stations at virtually the same time and such that each user has independent control of that portion of the image drawn or written by that user.

Claim 9. (Twice Amended) The system of Claim 8, wherein said system is comprised of more than two stations, and wherein the same image [instructional information] is virtually simultaneously displayed on said monitors [at each of said] of more than two stations as it is being [simultaneously] input at [each] any of said [two] stations.

Claim 10. (Twice Amended) The system of Claim 8, wherein one of said two stations is adapted for an instructor and one of said two stations is adapted for one or more students.

Claim 11. (Twice Amended) The system of Claim 10, wherein said instructor's station selectively controls the display of the [instructional] electronic information on said monitors of said students' station.

Claim ~~12~~ 17. (Twice Amended) The system of Claim ~~8~~ 13, wherein said input means is comprised of a user controlled hand-held stylus, stylus sensor, and stylus interface means for communicating handwritten [instructional] or hand-drawn information from said stylus sensor to said peripheral interface means.

Claim 15. (Twice Amended) The system of Claim 12, wherein said handwritten [instructional] or hand-drawn information inputted via said input means is selectively and simultaneously displayed on said monitors of more than ~~two~~ of said stations.

Claim 16. (Twice Amended) An instructional information system for use in an educational classroom, said system comprising:

at least two remotely-located user stations in which one station is an instructor station and one or more stations are student stations, said instructor station including means for controlling said instructional information system;

interactive monitor means, located in each of said user stations, for visually displaying instructional information to the user of that station and for accepting freehand inputted instructional information from the user of that station; and

network communication means, connected to each user station, for communicating said inputted and displayed instructional information between said interactive monitor means of all user stations, said network communication means controlled by said instructor station controlling means to selectively and simultaneously display instructional information input and displayed at said instructor's station on said interactive monitor means of any of said student stations at virtually the same time as and without interfering with the control of inputted instructional information [is] being accepted from the user of that student station.

Claim 22. (Once amended) The system of Claim 21, wherein said system includes more than two remotely-located stations, and wherein said [communication means] system further includes more than two input means for entering handwritten [instructional] information in freehand form from more than two stations at substantially the same time.

Claim 23. (Once amended) The system of Claim 2, wherein said communications means selectively affords said instructor's station to ~~virtually simultaneously transmit~~ virtually simultaneously and concurrently transmit said [instructional] ~~educational~~ information being handwritten at said instructor's station to all of said monitor means at all of said students' stations.

Claim 26. (Once amended) The system of Claim 10, wherein said instructor's station selectively controls the input means [of the instructional information on said monitors] of said students' station.

Claim 27. (Once amended) A method for providing [instructional] educational information from a first station to a second remotely-located station of a computer assisted [instructional delivery] communication system, each of said first and second stations having an input device for directly inputting hand-drawn graphical information from a user of that station, and having a display monitor for displaying an image of said graphical information to the user of that station, the [delivery] communication system including a computer network for transferring said graphical information between said first and second stations at virtually the same time as it is being input, the method comprising the steps of:

inputting primary hand-drawn graphical information into said system by a user at said first station;

displaying an image of said primary information to the user of said first station at virtually the same time as it is being input by the user of said first station;

transferring said primary information from said first station to said second station over said computer network;

displaying an image of said primary information to the user of said second station at virtually the same time as it is being input by the user of said first station;

inputting secondary hand-drawn graphical information into said system by a user at said second station [, said secondary information based upon said primary information] at the

same time as primary hand-drawn graphical information is being input into said system by the user at said first station;

transferring said secondary information from said second station to said first station over said computer network; and

displaying an image of said secondary information to the user of said first station along with said displayed image of said primary information at virtually the same time as said secondary information is being input by the user of said second station and with independent control of that portion of the primary or secondary information being input.

Claim 28. (Once amended) The method according to Claim 27, wherein said computer assisted [delivery] communication system includes a third station, and wherein the method further comprises the step of displaying an image of said primary information to the user of said third station at virtually the same time as it is being input by the user of said first station.

Please add the following new dependent claims:

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Claim 34. The system of Claim 1, wherein said communication means includes means for transmitting one pixel of said ~~electronic~~ information being entered simultaneously and concurrently at either of said ~~two~~ input means from either station to the other station on a pixel-by-pixel basis from alternating stations.

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Claim 35. The system of Claim 1, wherein said communication means includes means for enabling the display of one pixel of said ~~electronic~~ information being entered simultaneously and concurrently at either of said ~~two~~ input means from either station to the other station on a pixel-by-pixel basis from alternating stations.

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Claim 36. The system of Claim 1, wherein said communication means includes means for queuing said ~~electronic~~ information being simultaneously and concurrently transmitted from either station to the other station.

23 13

Claim 37. The system of Claim ~~8~~, wherein said communication network means includes means for simultaneously and concurrently communicating one pixel of said information in real time between the peripheral interface means of ~~two~~ said stations on an alternating-station pixel-by-pixel basis during the time the information is being entered simultaneously and concurrently at all ~~at both~~ of said stations.

Claim 38. The system of Claim 16, wherein said network communication means includes means for communicating said inputted and displayed instructional information between said interactive monitor means of all user stations in a pixel-by-pixel format, and for queuing each pixel of said instructional information at each station during the time information is being simultaneously ~~entered at each~~ and concurrently transmitted from either station to the other station.

Claim 39. The method according to Claim 27, wherein the method further comprises the step of storing said primary information from said first station in said second station at virtually the same time that secondary hand-drawn graphical information is being input into said system by a user at said second station.

Claim 40. The method according to Claim 27, wherein said primary and secondary information inputting, displaying, and transferring steps are performed on a pixel-by-pixel basis.

Claim 41. The method according to Claim 31, wherein said primary and secondary information inputting, displaying, and transferring steps are performed on a pixel-by-pixel basis.

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REMARKS

Applicant respectfully requests favorable reconsideration of the present application in light of the above amendments and in view of the reasons which follow. Upon review of the preceding Office Action, it is believed that the amended claims are now in proper condition for allowance.

After entry of the above amendments, claims 1-5 and 7-41 are pending in this application.

Applicant sincerely thanks Examiner Crosby for his time and helpful suggestions in amending the claims of this application during the telephone interviews of March 18 and 25, 1992.

Applicant assumes that Applicant's Proposed Amendment B, which was transmitted via facsimile to Examiner Crosby on March 19, 1992, has not been entered. Accordingly, Applicant includes herewith substantially the same amendments to the claims as previously set forth. The above changes to claims 1-33 are exactly the same as those set forth in Applicant's Proposed Amendment B, except for the following changes (which have been indicated above using double underlining):

Claim 1, line 14, "simultaneously" has been added after "entered" to further clarify that the present invention has the capability to process information from both input stations while both users are writing at exactly the same time;

Claim 8, line 23, "and simultaneously" has been added after "independently" for the same reason;

Claim 27, lines 25-27, "at the same time as primary hand-drawn graphical information is being input into said system by the user at said first station" has been added for the same reason; and

Claim 27, lines 35-36 were changed as discussed with Examiner Crosby on March 25.

New dependent Claims 34-41 have been added to further define specific features of the invention.

In response to the Examiner's objection to the specification, Applicant has included with this response a Substitute Specification (without claims) which includes all the changes set forth in Applicant's Amendment A, dated August 5, 1991, as well as those amendments to the specifications set forth above. No other changes to the specification have been made. All amendments to the specification are of a minor formal or technical nature. No new matter has been added to the specification.

Regarding the drawings, Applicant has included new formal drawings with this Amendment.

In the previous Office Action, the Examiner has rejected claims 1-33 under 35 U.S.C. § 103 as being unpatentable over Abrahamson et al. (U.S. Patent No. 5,002,491) in view of

Shapiro (U.S. Patent No. 4,785,472). Applicant respectfully traverses this rejection.

The teachings of these references were discussed during the telephone interviews with Examiner Crosby, and it was agreed that any combination of these references could not perform the functions of Applicant's invention, and that Applicant's claims should be amended to clarify these distinctions. Accordingly, the claims were amended in Proposed Amendment B to more particularly point out and distinctly claim the subject matter of the invention. Applicant believes that the claims, as amended, properly distinguish over the prior art of record.

More specifically, Abrahamson does not provide for the ability to input handwritten or freehand or graphical information into the system, as required by Applicant's claims. Although Shapiro teaches the use of a graphics tablet at the teacher's station, there is no teaching or suggestion to provide one at the student's station in accordance with Applicant's claims. Moreover, the use of a graphics tablet (or mouse) requires a substantially different kind of hand-eye coordination than the use of a pen or stylus for writing on the surface on which an image appears, as required by claim 8 and other claims. Therefore, the combination of Abrahamson and Shapiro cannot simulate two users writing on the same sheet of "electronic paper" from different workstations.

Even if the proposed combination of Abrahamson and Shapiro were modified to provide for the ability to input

handwritten information at both the teacher and student stations, the proposed combination would not include any communication means for virtually simultaneously transmitting the electronic information being simultaneously entered at either station to the other station, and for enabling the virtually simultaneous display of the transmitted information at both of the stations such that electronic information being entered at a first station appears at both stations at substantially the same time while under the independent control of the first station. In other words, the proposed combination could not provide real-time, simultaneous, two-way communication of handwritten information between the interactive monitors of two or more stations.

Applicant respectfully traverses the Examiner's rejection of claims 1-2, 4-27, and 31-33 under 35 U.S.C. § 103 based upon the combination of a remote controlling program such as Carbon Copy, PC Anywhere, or EasyLan with a painting or drawing program such as PC paint, Dr. Halo, or AutoCad. Applicant submits that these programs, even if they were found to be prior art, cannot virtually simultaneously transfer graphical information generated at one PC station in freehand form, e.g., using a stylus or a mouse, to the display screen of another PC station, and vice-versa, with independent control of the single image appearing on each display, i.e., one mouse would fight with the other mouse for control of the cursor. Hence, the electronic information entered by one user of the proposed system would not be under the independent control of that user and, thus, could

not simulate two users writing on the same sheet of "electronic paper" from different workstations.

Applicant has recently been made aware of U.S. Patent No. 5,073,926, (Suzuki et al.), of which a copy is enclosed and listed on the Supplemental Information Disclosure Statement, also enclosed. A Petition and Certification under 37 C.F.R. § 1.97(e) is also enclosed, along with a check for the $130.00 Petition Fee. The Examiner is requested to consider the Suzuki reference and make it of record in the subject application.

Suzuki et al., U.S. Patent No. 5,073,926, describes a two-way picture communication system having a telephone, a video camera, and video display monitor at each terminal to provide both digital video and audio communications. Suzuki also describes a line drawing apparatus, including a writing tablet using a liquid crystal display, for generating line drawings to be transmitted with the video signals. However, Suzuki's use of "relative coordinate areas" (regions of proximate stylus inputs accumulated prior to transmission to the remote station) severely limits the simultaneity and accuracy of a line drawing appearing on the remote station -- particularly in the event that more than one station is simultaneously receiving stylus input. Hence, as explained below, Suzuki does not teach or suggest Applicant's claimed method and means for virtually simultaneously transmitting information being entered simultaneously at either station to the other station, and for enabling the virtually simultaneous display of the transmitted information at both

stations such that it appears on both monitors at substantially the same time while under the independent control of each user. In other words, like the combination of the other art discussed above, Suzuki cannot simulate two users writing simultaneously and independently on the same sheet of "electronic paper" from different workstations.

More specifically, the teachings of Suzuki provide inadequate means to manage the more complex requirements for simultaneously displaying electronic information which is being simultaneously input at each station, since the electronic information entered by one user of the Suzuki system would not be under the independent control of that user. Using the "relative coordinate area" scheme (which Suzuki describes in Figures 9-12 and at column 10, lines 44-45, et seq.), if a set of line drawing data (consisting of possibly twelve to fifteen or more pixel identifiers connected by a single straight line, e.g., Figure 12) arrives from the remote station to be displayed at the local station while the local stylus is in use, that remote station input data cannot be displayed until the local stylus has been moved out of a relative coordinate area (i.e., while LOOP1 of Figure 9 is iterating). Under numerous common circumstances of freehand writing (such as when the pen tip is indefinitely or momentarily at rest on the surface, or when it is slowing to a stop, or when it is making a small mark like dotting an "i", or when it is moving in a continuous lateral motion), the LOOP1 iteration continues indefinitely (such as in the example Suzuki

describes at column 11, lines 10-16) and thus any input from the remote station is blocked (column 12, lines 22-28). Accordingly, the display at the local station is not under the independent control of the user at the remote station until such time as the local stylus actually moves out of its relative coordinate area. This prevents the simultaneous display of electronic information input from the remote station while the local station information is being processed. Moreover, the Suzuki technique produces an even more undesirable effect in that subsequent remote input (i.e., input arriving from the remote station while a set of line drawing data is already waiting) could be lost when both styluses are in simultaneous use. Thus, Suzuki places severe limits on the practicability of the system when both users are drawing at the same time.

The present invention, however, is adapted to handle more complex traffic management requirements for the unimpeded displaying of both inputs -- even while both styluses are in simultaneous use. As depicted in Applicant's Figure 3A (and described at page 12, line 10 et seq.), three communication sub-systems are concurrently operating, whereby line drawing data is displayed every time the stylus crosses a new pixel. (See page 13, line 17- page 14, line 9; page 14, line 19; page 15, line 1; and page 19, lines 3-17.) This pixel-by-pixel basis of transmitting and displaying information produces a much truer "simultaneity of display" than the prior art technique of accumulating pixels in relative coordinate areas prior to

transmission. Furthermore, in the present invention, pixel-by-pixel data is queued for immediate and independent display at each station -- even when the stylus at both stations are simultaneously in use. (See page 14, lines 14-21 which references the queuing system, and page 25, line 31- page 27, line 6 which discusses the queuing system of Figure 7.)

In review, the prior art does not teach or suggest the unimpeded real-time simultaneous two-way communication of handwritten electronic information while both styluses are in simultaneous use. Accordingly, the prior art systems could not realistically simulate two users writing at the same time on the same sheet of "electronic paper" from different workstations. Hence, the present invention uniquely provides real-time, simultaneous, two-way communication of handwritten instructional information between the interactive monitors of two or more stations.

Applicant believes that the present application is now in condition for allowance. Favorable consideration of the amended claims is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required to this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 23-0920. Should no proper payment be enclosed

herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 23-0920. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

WELSH & KATZ, LTD.

Date: 5/20/92

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